10. CEILING SUSPENSION TYPE PACKAGED AIR-CONDITIONER

(Split system, Air to air heat pump type)

Refrigerant R22 use models

FDEN 208HEN-S1
258HEN-S1

Alternative refrigerant R407C use models

FDENP208HEN-S
258HEN-S
308HEN-S
308HEN-S
408HES-S
508HES-S

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10.1 GENERAL INFORMATION

10.1.1 Specific features

(1) Less refrigerant charge amount due to use of double phase refrigerant flow system. The total refrigerant charge amount has been reduced by more than 50%.

(2) The indoor outdoor interconnection signal wiring has been done away with. The microcomputer chip is installed in the indoor unit. There is no need for the unit to communicate between the outdoor and indoor units so the unit is more resistant to electromagnetic noise thus the incidence of microcomputer malfunction has been reduced. The compressor in the outdoor unit has its own self protection function, that reacts according to abnormal high pressure and excessive high temperature.

(3) There are only four power lines between the outdoor and indoor unit. As no signal wire is used there is no need to separate the power line from the signal line. One cab tyre cable with 6 wires encased in one sheath is enough for conducting the wiring work between the outdoor unit and the indoor unit. This contributes to simpler wiring work in the field.

(4) All air supply ports have auto swing louvers. The indoor fan motor has two speeds of high and low.

(5) The controls are wireless residential split air conditioner type remote controller with 5 malfunction modes.

(6) All models have service valves protruding from the outdoor unit for faster flare connection work in the field.

(7) Simple design

With the model change, the design has been completely renewed. A simple and modern form with curves harmonizes more with the interior. The suction grill also comes in two segments, simplifying the maintenance.

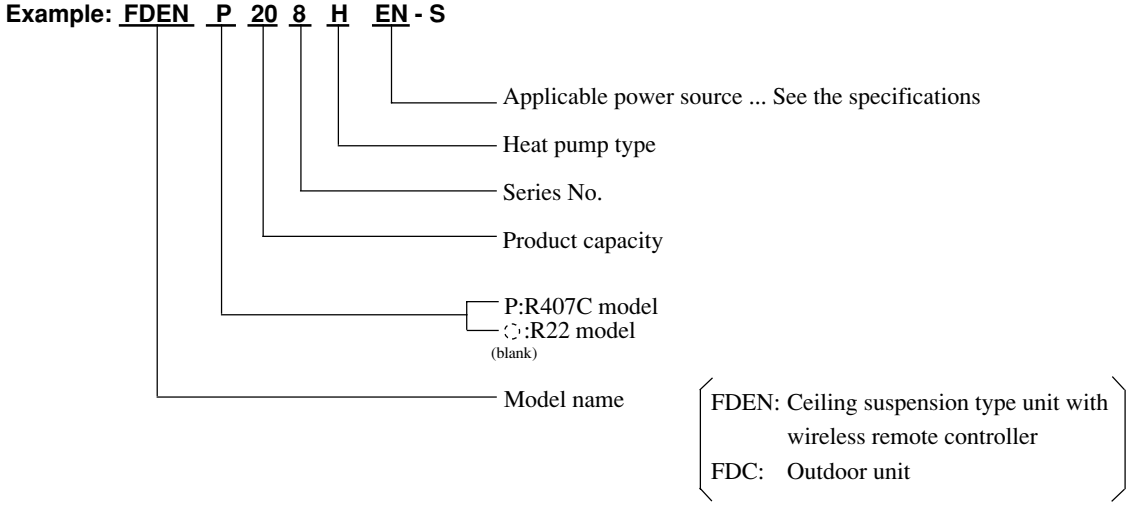
(8) Amazingly quiet operation

Due to adoption of a newly developed silent stream fan, unpleasant operation sound, such as sound made when the fan runs against the air, has been minimized, thus achieving the trade's lowest noise level in the weak flow mode.

(9) "Aerowing" louver

In order to make air conditioning more comfortable, an "aerowing" louver has been newly developed by applying MHI's advanced aerodynamics, leading to improved air directivity and air conditioning feeling. In the auto swing mode, the louver angle is optimum from 0 (level) to 75°, thus distributing the refreshing air evenly throughout your room. By working the remote controller, you can also set the louver angle easily. The sideways blowout angle can also be set manually up to 45° either right or left side.

10.1.2 How to read the model name



10.2 SELECTION DATA

10.2.1 Specifications

(1) Refrigerant R22 use models

Model FDEN208HEN-S1

Item		Model	FDEN208HEN-S1	
			FDEN208H	FDC208HEN3A
Nominal cooling capacity(1)		**W**	**5000**	
Nominal heating capacity(1)		**W**	**5400**	
Power source			**1 Phase, 220/240V, 50Hz**	
Operation data(3)	Cooling input	kW	1.77/1.86	
	Running current (Cooling)	A	8.2/8.0	
	Power factor (Cooling)	%	98/97	
	Heating input	kW	1.73/1.83	
	Running current (Heating)	A	8.0/7.8	
	Power factor (Heating)	%	98/98	
	Inrush current (L.R.A)	A	44	
	Noise level(4)	dB(A)	Hi: 43 Lo: 38	52
Exterior dimensions Height × Width × Depth		**mm**	**184× 1000 × 650**	**690 × 880 × 290**
Net weight		**kg**	**22**	**49**
Refrigerant equipment Compressor type & Q'ty			–	**RM5523GNE4 × 1**
	Motor	**kW**	–	**1.7**
	Starting method		–	Line starting
Heat exchanger			Louver fines & inner grooved tubing	Slitted fines & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R22**	
Quantity		**kg**	**Holding charged**	**0.98 [Pre-charged up to the piping length of 0m]**
Refrigerant oil		ℓ	–	0.7 (BARREL FREEZE 32SAM)
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 2	Propeller fan × 1
	Motor	**W**	**40 × 1**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:14 Lo:10**	**56**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Polypropylene net × 2 (washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	20 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Abnormal discharge temperature protection
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ6.35 (1/4″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP20)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller	
Optional parts			–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO-T1, JIS B8616
Heating	20˚C	–	7˚C	6˚C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. JIS B8616 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220/240V 50Hz.

(4) Indicates the value at mild mode .

Model FDEN258HEN-S1

Item		Model	FDEN258HEN-S1	
			FDEN258H	FDC258HEN3A
Nominal cooling capacity(1)		**W**	**5700**	
Nominal heating capacity(1)		**W**	**6100**	
Power source			**1 Phase, 220/240V, 50Hz**	
Operation data(3)	Cooling input	kW	2.04/2.15	
	Running current (Cooling)	A	9.4/9.4	
	Power factor (Cooling)	%	99/95	
	Heating input	kW	1.94/2.09	
	Running current (Heating)	A	9.1/9.2	
	Power factor (Heating)	%	97/95	
	Inrush current (L.R.A)	A	51	
	Noise level(4)	dB(A)	Hi: 44 Lo: 39	52
Exterior dimensions Height × Width × Depth		**mm**	**184 × 1260 × 650**	**845 × 880 × 340**
Net weight		**kg**	**27**	**55**
Refrigerant equipment Compressor type & Q'ty			–	**RM5526GNE4 × 1**
	Motor	**kW**	–	**1.9**
	Starting method		–	Line starting
Heat exchanger			Louver fines & inner grooved tubing	Slitted fines & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R22**	
Quantity		**kg**	**Holding charged**	**1.1 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	0.7 (BARREL FREEZE 32SAM)
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 4	Propeller fan × 1
	Motor	**W**	**25 × 2**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi: 16 Lo: 10.5**	**56**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Polypropylene net ×2 (washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	20 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment(5)			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Abnormal discharge temperature protection
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP20)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller	
Optional parts			–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	–	7°C	6°C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. JIS B8616 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220/240V 50Hz.

(4) Indicates the value at mild mode.

(2) Alternative refrigerant R407C use models

Model FDENP208HEN-S

Item		Model	FDENP208HEN-S	
			FDEN208H	FDCP208HEN3A
Nominal cooling capacity(1)		W	**5000**	
Nominal heating capacity(1)		W	**5400**	
Power source			**1 Phase, 220/240V, 50Hz**	
Operation data(3)	Cooling input	kW	2.08/2.15	
	Running current (Cooling)	A	9.5/9.6	
	Power factor (Cooling)	%	99/93	
	Heating input	kW	1.98/2.12	
	Running current (Heating)	A	9.3/9.5	
	Power factor (Heating)	%	97/93	
	Inrush current (L.R.A)	A	55	
	Noise level(4)	dB(A)	Hi: 43 Lo: 38	52
Exterior dimensions Height × Width × Depth		**mm**	**184× 1000 × 650**	**690 × 880 × 290**
Net weight		**kg**	**22**	**49**
Refrigerant equipment Compressor type & Q'ty			–	**RM5523HNE5 × 1**
Motor		kW	–	**1.7**
Starting method			–	Line starting
Heat exchanger			Louver fines & inner grooved tubing	Slitted fines & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R407C**	
Quantity		**kg**	**Holding charged**	**0.98 [Pre-charged up to the piping length of 0m]**
Refrigerant oil		ℓ	–	**0.7 (MA32)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 2	Propeller fan × 1
Motor		W	**40 × 1**	**55 × 1**
Starting method			Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:14 Lo:10**	**56**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Polypropylene net × 2 (washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	20 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Thermostat for discharge temperature.
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ6.35 (1/4″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP20)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller	
Optional parts			–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	–	7°C	6°C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. JIS B8616 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220/240V 50Hz.

(4) Indicates the value at mild mode .

Model FDENP258HEN-S

Item		Model	FDENP258HEN-S	
			FDEN258H	FDCP258HEN3A
Nominal cooling capacity(1)		W	**5700**	
Nominal heating capacity(1)		W	**6100**	
Power source			**1 Phase, 220/240V, 50Hz**	
Operation data(3)	Cooling input	kW	2.35/2.55	
	Running current (Cooling)	A	11.4/12.6	
	Power factor (Cooling)	%	94/84	
	Heating input	kW	2.09/2.34	
	Running current (Heating)	A	10.5/12.0	
	Power factor (Heating)	%	90/81	
	Inrush current (L.R.A)	A	63	
	Noise level(4)	dB(A)	Hi: 44 Lo: 39	52
Exterior dimensions Height × Width × Depth		**mm**	**184 × 1260 × 650**	**845 × 880 × 340**
Net weight		**kg**	**27**	**55**
Refrigerant equipment Compressor type & Q'ty			–	**RM5526HNE5 × 1**
	Motor	kW	–	**1.9**
	Starting method		–	Line starting
Heat exchanger			Louver fines & inner grooved tubing	Slitted fines & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R407C**	
Quantity		**kg**	**Holding charged**	**1.2 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**0.7 (MA32)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 4	Propeller fan × 1
	Motor	W	**25 × 2**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi: 16 Lo: 10.5**	**56**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Polypropylene net ×2 (washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	20 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment(5)			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Thermostat for discharge temperature.
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP20)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller	
Optional parts			–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	–	7°C	6°C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. JIS B8616 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220/240V 50Hz.

(4) Indicates the value at mild mode.

Model FDENP308HEN-S

Item		Model	FDENP308HEN-S	
			FDEN308H	FDCP308HEN3
Nominal cooling capacity(1)		W	**7100**	
Nominal heating capacity(1)		W	**8000**	
Power source			**1 Phase, 220/240V, 50Hz**	
Operation data(3)	Cooling input	kW	3.22/3.37	
	Running current (Cooling)	A	14.9/15.3	
	Power factor (Cooling)	%	98/92	
	Heating input	kW	2.97/3.11	
	Running current (Heating)	A	13.9/14.3	
	Power factor (Heating)	%	97/91	
	Inrush current (L.R.A)	A	95	
	Noise level(4)	dB(A)	Hi 45 Lo:39	52
Exterior dimensions Height × Width × Depth		**mm**	**184 × 1260 × 650**	**845 × 880 × 340**
Net weight		**kg**	**27**	**76**
Refrigerant equipment Compressor type & Q'ty			–	**GT-A5534HN41 × 1**
	Motor	kW	–	**2.5**
	Starting method		–	Line starting
Heat exchanger			Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R407C**	
Quantity		**kg**	**Holding charged**	**1.75 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**1.45 (MA32)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 4	Propeller fan × 1
	Motor	W	**35 × 2**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:16.5 Lo:11.5**	**58**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Polypropylene net ×2(washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	33 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Thermistor for discharge temperature.
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP20)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller.	
Optional parts			–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	–	7°C	6°C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. JIS B8616 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 220/240V 50Hz.

(4) Indicates the value at mild mode.

Model FDENP308HES-S

Item		Model	FDENP308HES-S	
			FDEN308H	FDCP308HES3
Nominal cooling capacity(1)		W	**7100**	
Nominal heating capacity(1)		W	**8000**	
Power source			**3 Phase, 380/415V 50Hz**	
Operation data(3)	Cooling input	kW	3.14/3.29	
	Running current (Cooling)	A	5.5/5.8	
	Power factor (Cooling)	%	87/79	
	Heating input	kW	2.99/3.13	
	Running current (Heating)	A	5.5/5.8	
	Power factor (Heating)	%	83/75	
	Inrush current (L.R.A)	A	45	
	Noise level(4)	dB(A)	Hi:45 Lo:39	52
Exterior dimensions Height × Width × Depth		**mm**	**184 × 1260 × 650**	**845 × 880 × 340**
Net weight		**kg**	**27**	**76**
Refrigerant equipment Compressor type & Q'ty			–	**GT-A5534ES41 × 1**
	Motor	kW	–	**2.5**
	Starting method		–	Line starting
Heat exchanger			Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R407C**	
Quantity		**kg**	**Holding charged**	**1.75 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**1.45 (MA32)**
Defrost control			IC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 4	Propeller fan × 1
	Motor	W	**35 × 2**	**55 × 1**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:16.5 Lo:11.5**	**58**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Polypropylene net ×2(washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	33 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Thermistor for discharge temperature.
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ15.88 (5/8″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP20)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller.	
Optional parts			–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1 JIS B8616
Heating	20°C	–	7°C	6°C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. JIS B8616 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 380/415V 50Hz.

(4) Indicates the value at mild mode.

Model FDENP408HES-S

Item		Model	FDENP408HES-S	
			FDEN408H	FDCP408HES3
Nominal cooling capacity(1)		W	**10000**	
Nominal heating capacity(1)		W	**11200**	
Power source			**3 Phase, 380/415V 50Hz**	
Operation data(3)	Cooling input	kW	4.51/4.63	
	Running current (Cooling)	A	7.8/8.2	
	Power factor (Cooling)	%	88/79	
	Heating input	kW	4.35/4.47	
	Running current (Heating)	A	7.8/8.2	
	Power factor (Heating)	%	85/76	
	Inrush current (L.R.A)	A	53	
	Noise level(4)	dB(A)	Hi: 49 Lo:43	54
Exterior dimensions Height × Width × Depth		**mm**	**239 × 1260 × 650**	**1050 × 920 × 340**
Net weight		**kg**	**34**	**98**
Refrigerant equipment Compressor type & Q'ty			–	**GU-A5550HS41 × 1**
Motor		kW	–	**2.8**
Starting method			–	Line starting
Heat exchanger			Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R407C**	
Quantity		**kg**	**Holding charged**	**2.12 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**1.6 (MA32)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 3	Propeller fan × 2
Motor		W	**35+ 55**	**40 × 2**
Starting method			Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:26 Lo:19**	**70**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Polypropylene net ×3(washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	40 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Thermistor for discharge temperature.
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ19.05 (3/4″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP20)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller.	
Optional parts			–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	–	7°C	6°C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. JIS B8616 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 380/415V 50Hz.

(4) Indicates the value at mild mode.

Model FDENP508HES-S

Item		Model	FDENP508HES-S	
			FDEN508H	FDCP508HES3
Nominal cooling capacity(1)		W	**12500**	
Nominal heating capacity(1)		W	**14000**	
Power source			**3 Phase, 380/415V 50Hz**	
Operation data(3)	Cooling input	kW	5.36/5.43	
	Running current (Cooling)	A	9.5/9.8	
	Power factor (Cooling)	%	86/77	
	Heating input	kW	5.24/5.31	
	Running current (Heating)	A	9.4/9.7	
	Power factor (Heating)	%	84/76	
	Inrush current (L.R.A)	A	74	
	Noise level(4)	dB(A)	Hi:50 Lo:44	55
Exterior dimensions Height × Width × Depth		**mm**	**239 × 1470 × 650**	**1250 × 920 × 340**
Net weight		**kg**	**40**	**107**
Refrigerant equipment Compressor type & Q'ty			–	**GU-A5560HS41 × 1**
	Motor	kW	–	**3.75**
	Starting method		–	Line starting
Heat exchanger			Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control			Capillary tube	
Refrigerant			**R407C**	
Quantity		**kg**	**Holding charged**	**2.58 [Pre-charged up to the piping length of 5m]**
Refrigerant oil		ℓ	–	**1.6 (MA32)**
Defrost control			MC controlled de-icer	
High pressure control			High pressure switch	
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 4	Propeller fan × 2
	Motor	W	**55 × 2**	**65 × 2**
	Starting method		Line starting	Line starting
Air flow (Standard)		**CMM**	**Hi:28 Lo:20**	**110**
Fresh air intake			Unavailable	–
Air filter, Q'ty			Polypropylene net ×3(washable)	–
Shock & vibration absorber			Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater		W	–	40 (Crank case heater)
Operation control Operation switch			Wireless remote control switch	– (Indoor unit side)
Room temperature control			Thermostat by electronics	–
Safety equipment			Internal thermostat for fan motor. Frost protection thermostat.	Internal thermostat for fan motor. Thermistor for discharge temperature.
Installation data Refrigerant piping size		**mm (in)**	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ19.05 (3/4″)**	
Connecting method			**Flare piping**	
Drain hose			(Connectable with VP20)	–
Insulation for piping			Necessary (both Liquid & Gas lines)	
Accessories			Mounting kit. Wireless remote controller.	
Optional parts			–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	–	7°C	6°C	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard. JIS B8616 "UNITARY AIR-CONDITIONERS"

(3) The operation data indicate when the air-conditioner is operated at 380/415V 50Hz.

(4) Indicates the value at mild mode.

10.2.2 Range of usage & limitations

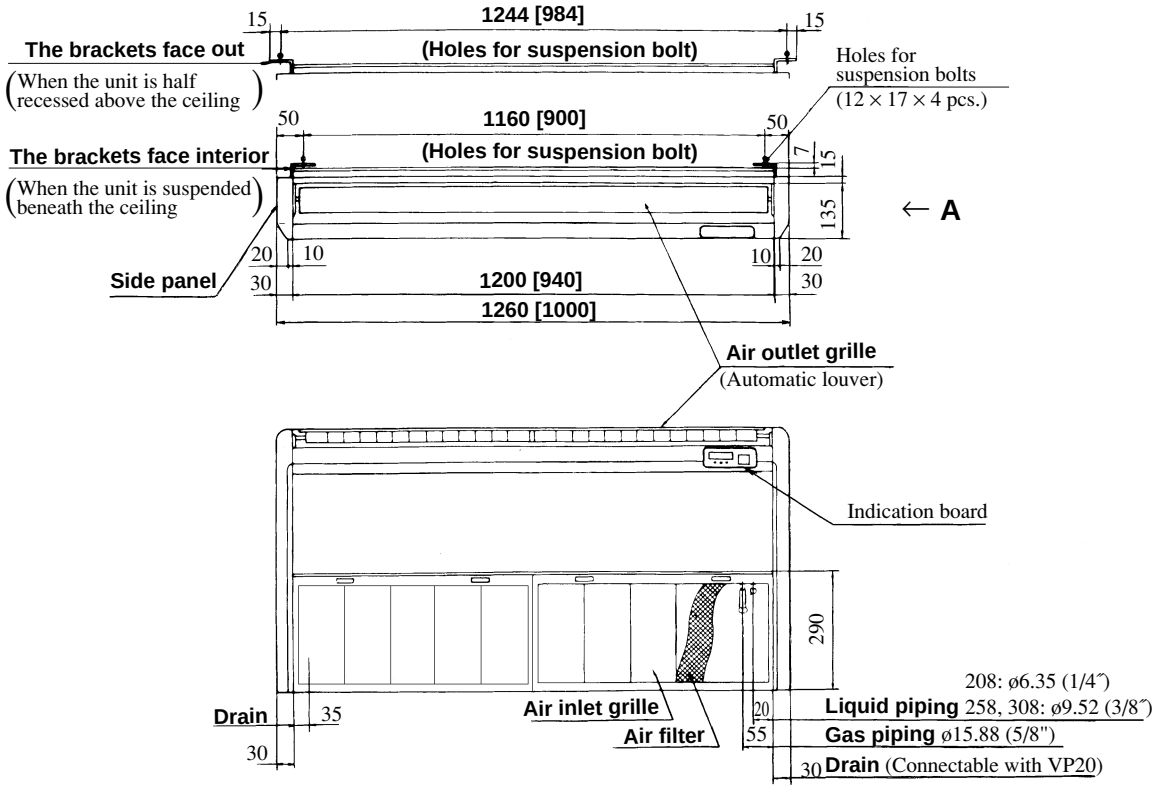
Item \ Models	FDENP208, 258 type	FDENP308~508 type
Indoor return air temperature (Upper, lower limits)	Refer to the selection chart	
Outdoor air temperature (Upper, lower limits)		
Refrigerant line (one way) length	Max. 30 m	Max. 50 m
Vertical height difference between outdoor unit and indoor unit	Max. 20 m (Outdoor unit is higher) Max. 15 m (Outdoor unit is lower)	Max. 30 m (Outdoor unit is higher) Max. 15 m (Outdoor unit is lower)
Power source voltage	Rating ± 10%	
Voltage at starting	Min. 85% of rating	
Frequency of ON-OFF cycle	Max. 10 times/h	
ON and OFF interval	Max. 3 minutes	

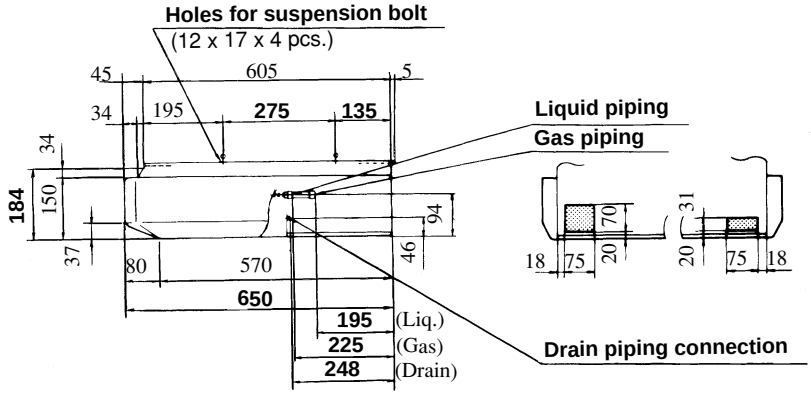
10.2.3 Exterior dimensions

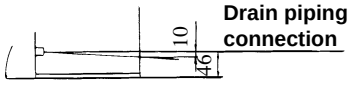
(1) Indoor unit

Models FDEN208H, 258H, 308H

Unit: mm



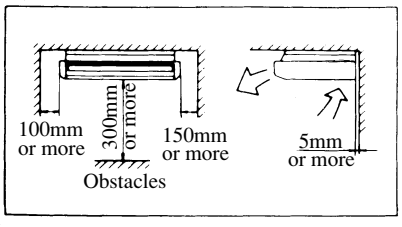




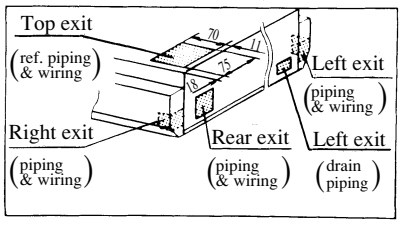
Note (1) The slope of drain piping inside the unit is able to take incline of 10 mm.

VIEW A

Space for installation & servicing



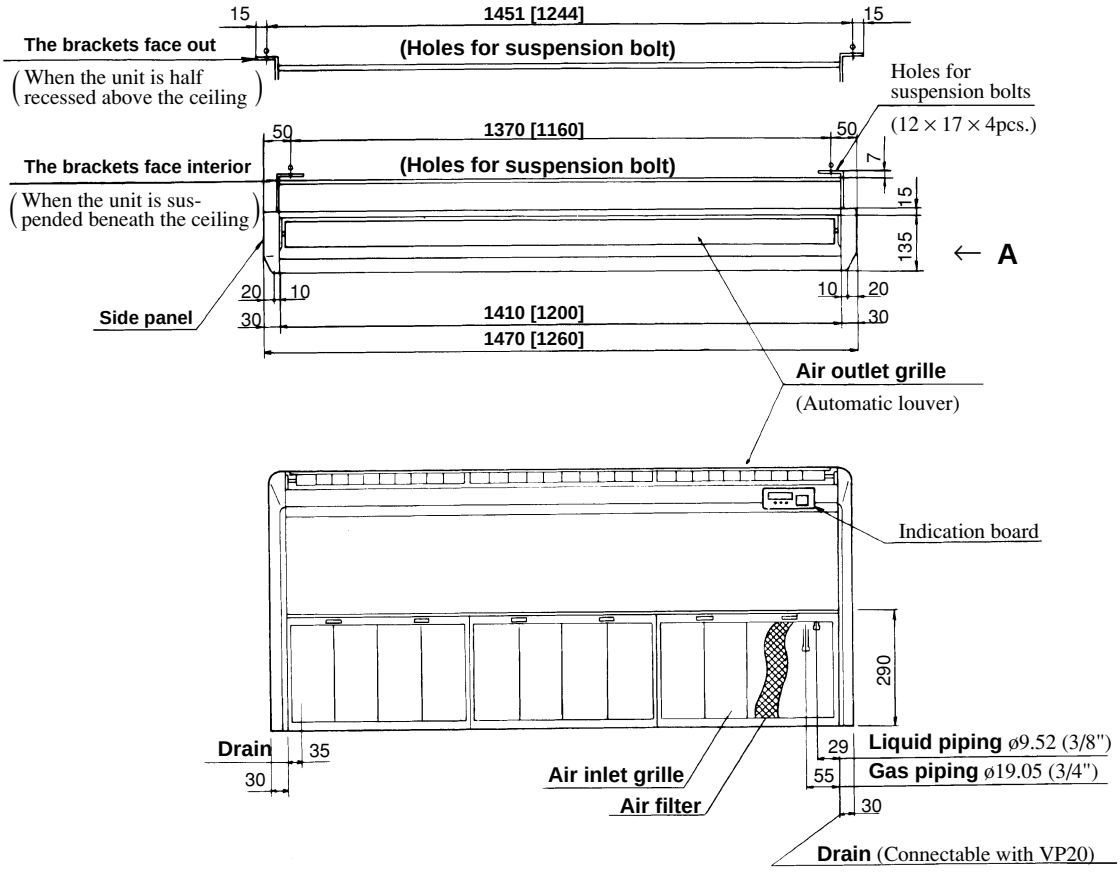
Piping & wiring draw out holes

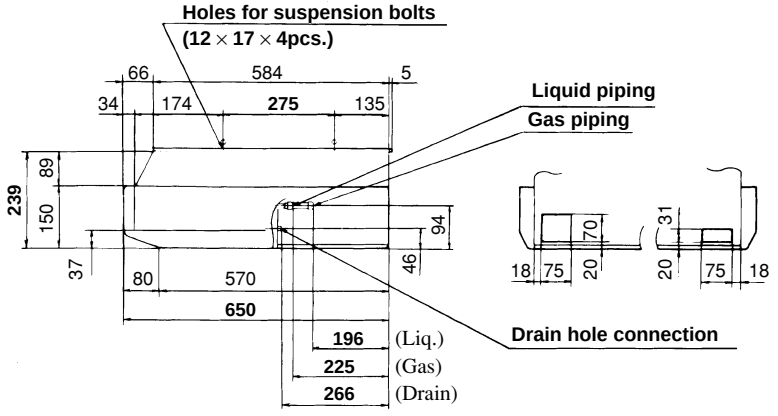


Note (1) The [ ] value dimension for models FDEN208H.

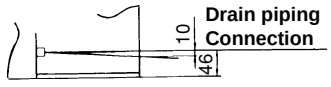
Models FDEN408H, 508H

Unit: mm





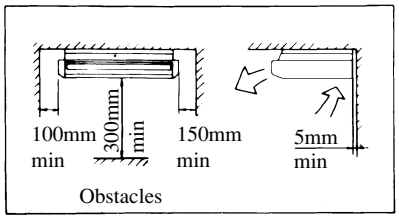
VIEW A



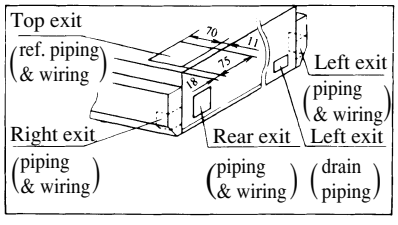
Note (1) The slope of drain piping inside the unit is able to take incline of 10 mm.

Space for installation & servicing

Ceiling suspension installation



Piping & wiring draw out holes

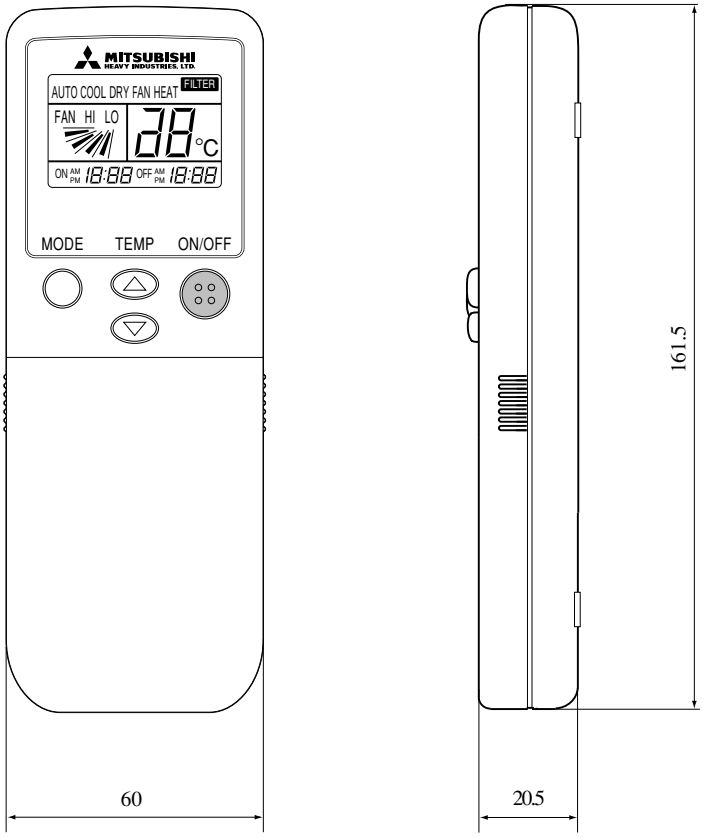


Note (1) The [ ] value dimension for models FDEN408H

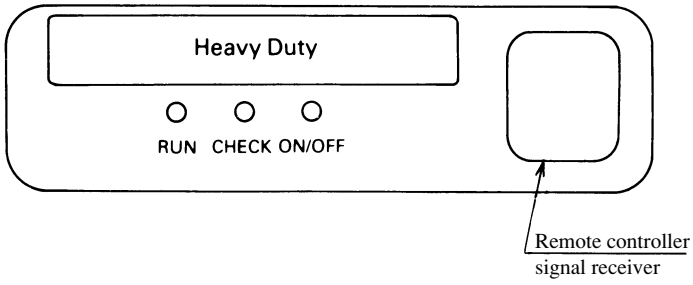
(2) Remote controller

(a) Wireless remote controller

Unit: mm



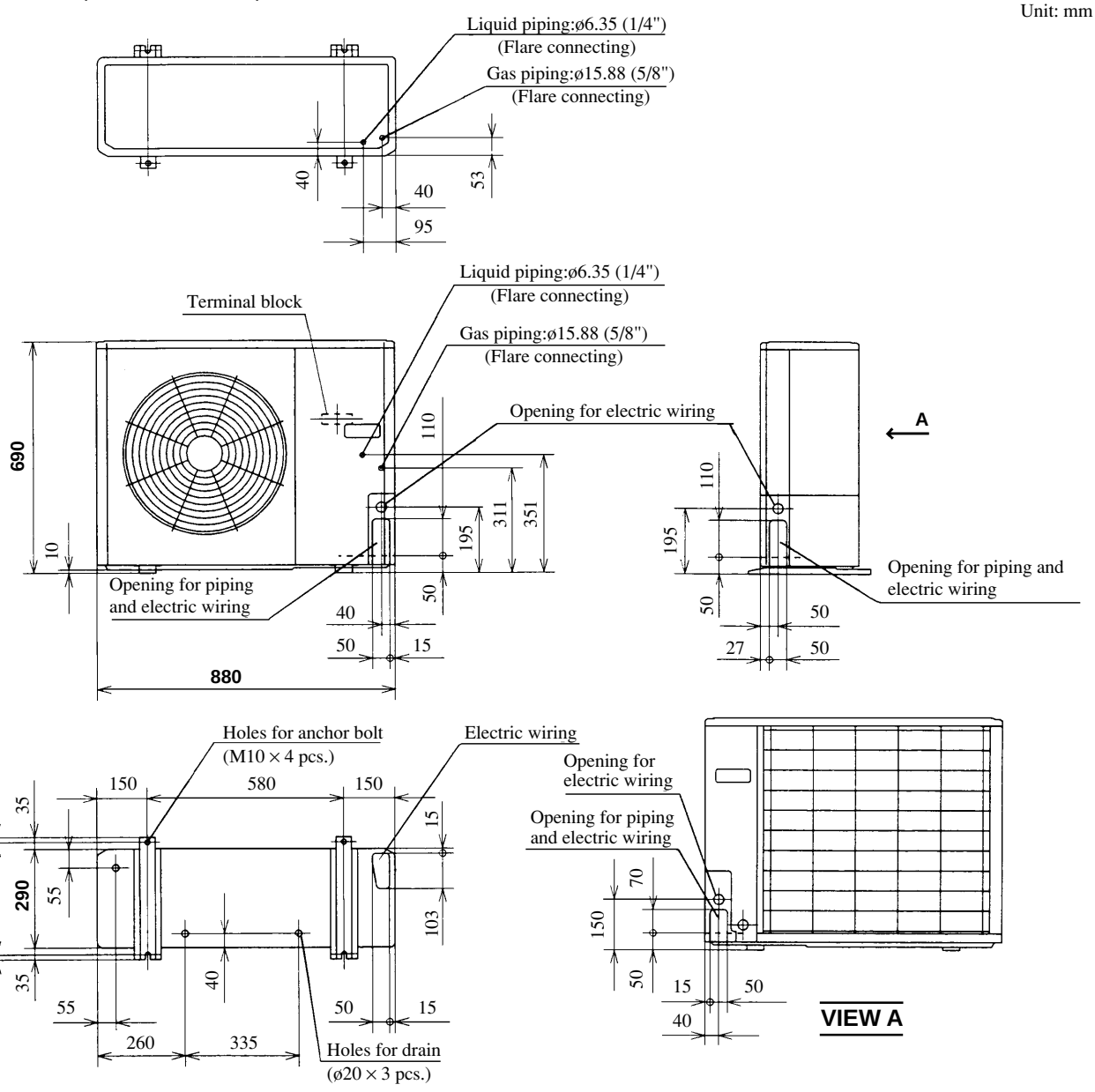
(b) Indication board of indoor unit



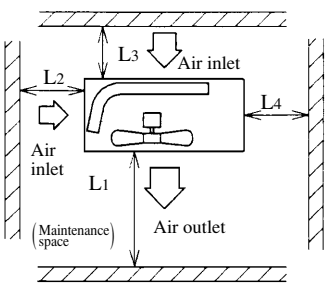
(3) Outdoor unit

Models, FDC208HEN3A, FDCP208HEN3A

Unit: mm



Required space for maintenance and air flow



Minimum allowable space to the obstacles

Unit:mm

Mark \ Installation type	Ⅰ	Ⅱ	Ⅲ
L_1	Open	Open	500
L_2	300	5	Open
L_3	100	150	100
L_4	5	5	5

Notes (1) Avoid the location where four sides are entirely surrounded by walls.

(2) Fix the unit by anchor bolts without fail. Restrict the protrusion length of anchor bolt to 15 mm and under.

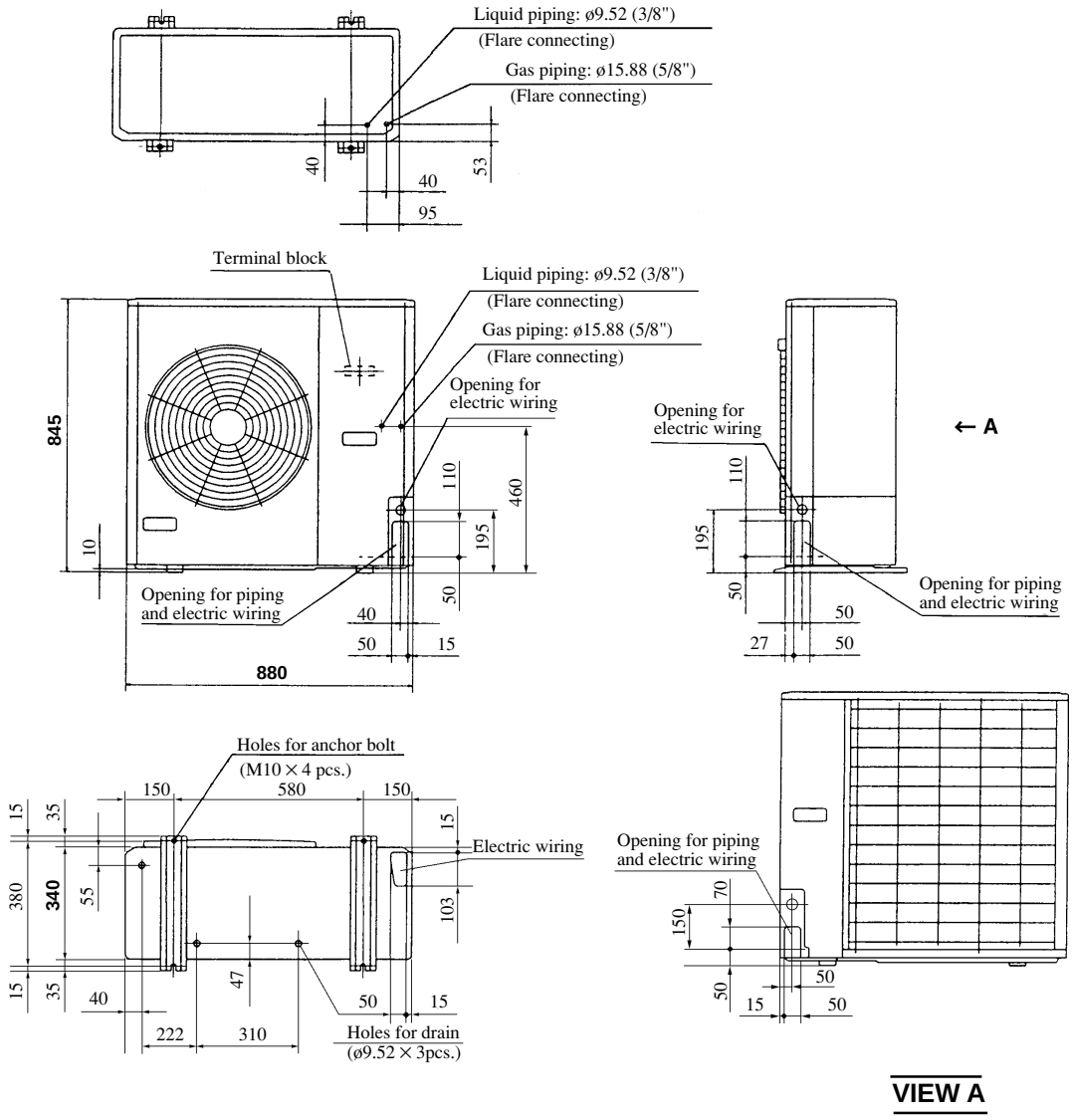
(3) When strong wind blows against the unit, direct the discharge port at a right angle to the wind direction.

(4) Secure the space of 1 m and over at the top of unit.

(5) Make the height of obstruction wall in front of discharge port lower than the height of unit.

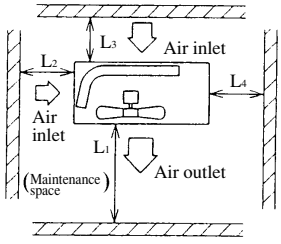
Models FDC258HEN3A, FDCP258HEN3A, 308HEN3, 308HES3

Unit: mm



VIEW A

Required space for maintenance and air flow



Minimum allowable space to the obstacles

Unit:mm

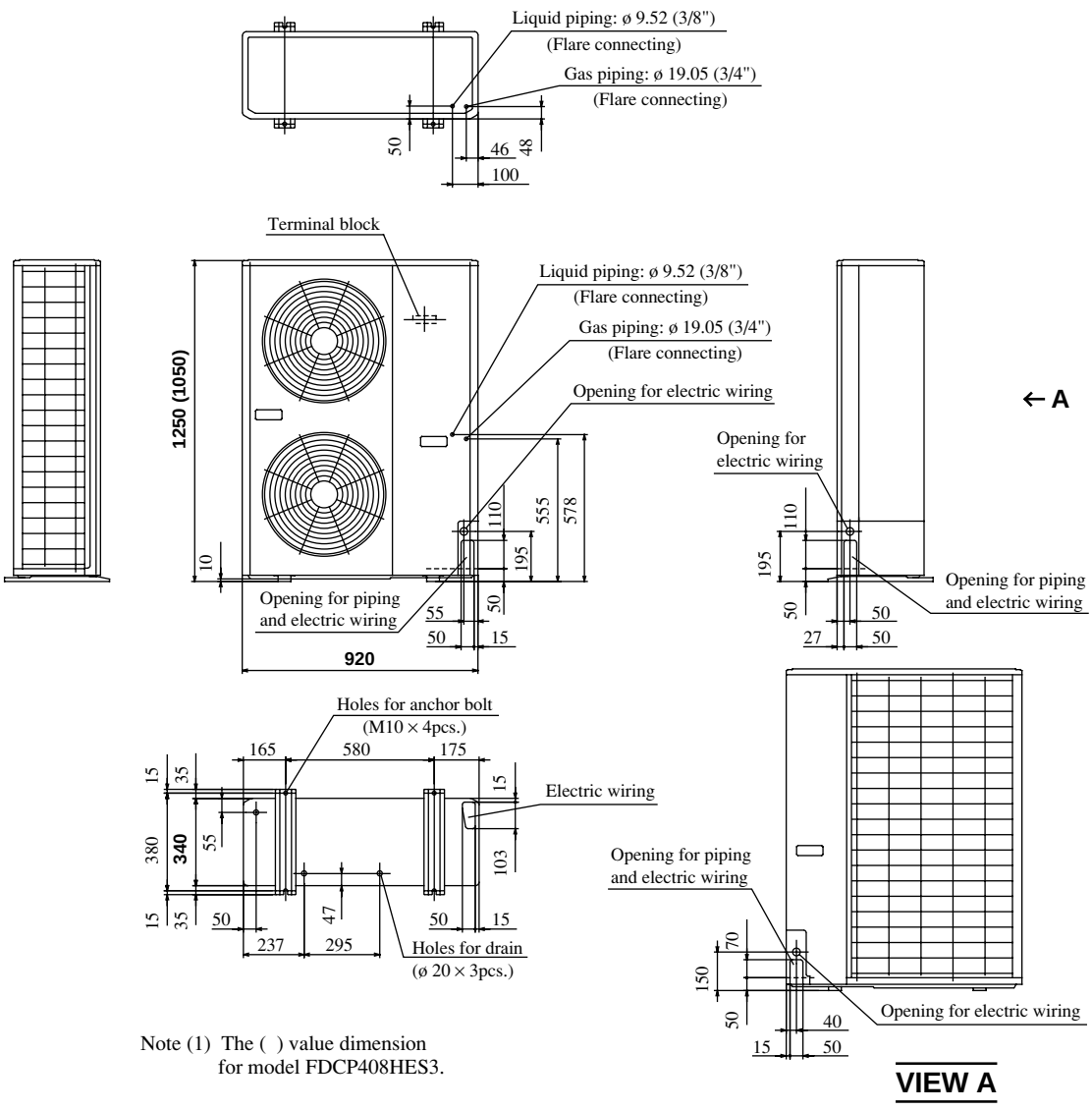
Mark \ Installation type	Ⅰ	Ⅱ	Ⅲ
L_1	Open	Open	500
L_2	300	5	Open
L_3	100	150	100
L_4	5	5	5

Notes

(1) Avoid the location where four sides are entirely surrounded by walls.
(2) Fix the unit by anchor bolts without fail. Restrict the protrusion length of anchor bolt to 15 mm and under.
(3) When strong wind blows against the unit, direct the discharge port at a right angle to the wind direction.
(4) Secure the space of 1 m and over at the top of unit.
(5) Make the height of obstruction wall in front of discharge port lower than the height of unit.

Models FDCP408HES3, 508HES3

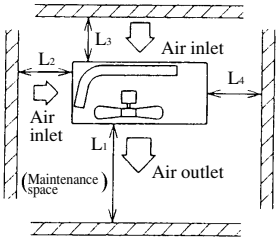
Unit: mm



Note (1) The ( ) value dimension
for model FDCP408HES3.

VIEW A

Required space for maintenance and air flow



Minimum allowable space to the obstacles

Unit:mm

Mark \ Installation type	Ⅰ	Ⅱ	Ⅲ
L_1	Open	Open	500
L_2	300	5	Open
L_3	150	300	150
L_4	5	5	5

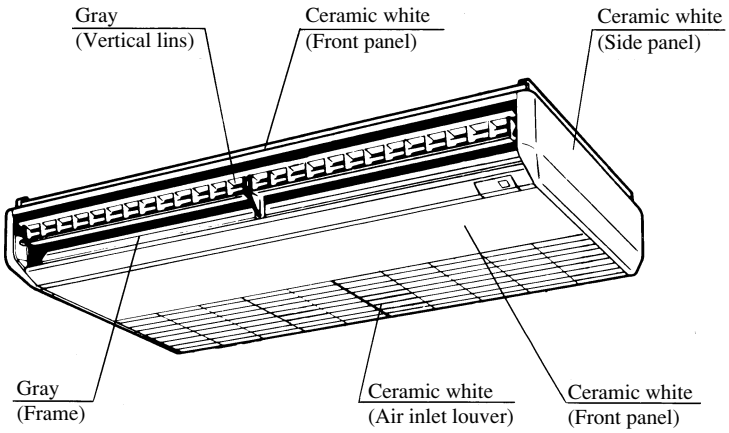
Notes

(1) Avoid the location where four sides are entirely surrounded by walls.
(2) Fix the unit by anchor bolts without fail. Restrict the protrusion length of anchor bolt to 15 mm and under.
(3) When strong wind blows against the unit, direct the discharge port at a right angle to the wind direction.
(4) Secure the space of 1 m and over at the top of unit.
(5) Make the height of obstruction wall in front of discharge port lower than the height of unit.

10.2.4 Exterior appearance

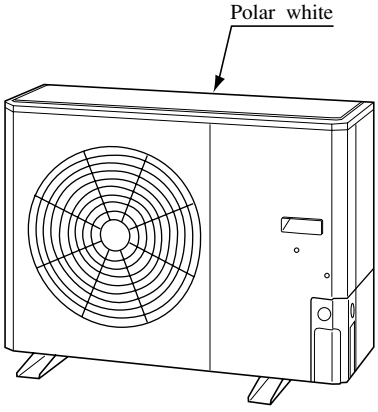
(1) Indoor unit

Model All models

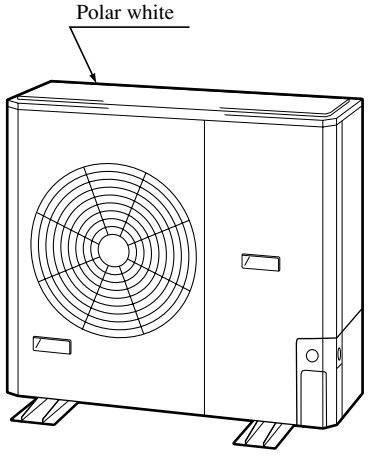


(2) Outdoor unit

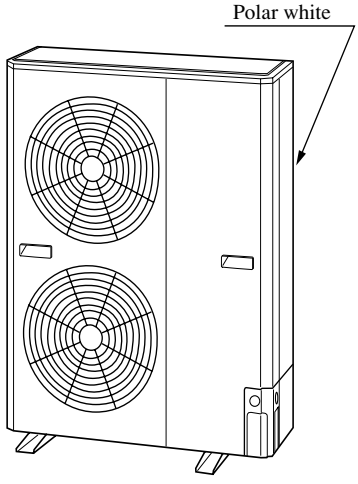
Models FDC208HEN3A
FDCP208HEN3A



Models FDC258HEN3A
FDCP258HEN3A
308HEN3
308HES3

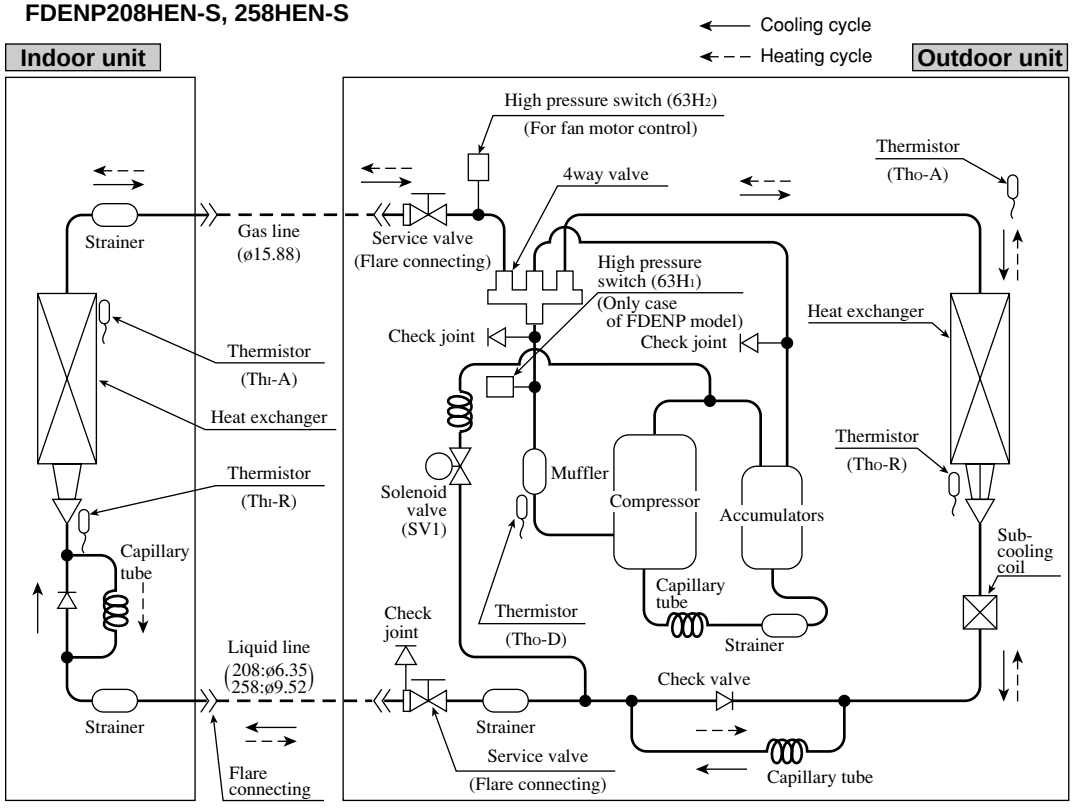


Models FDCP408HES3
508HES3

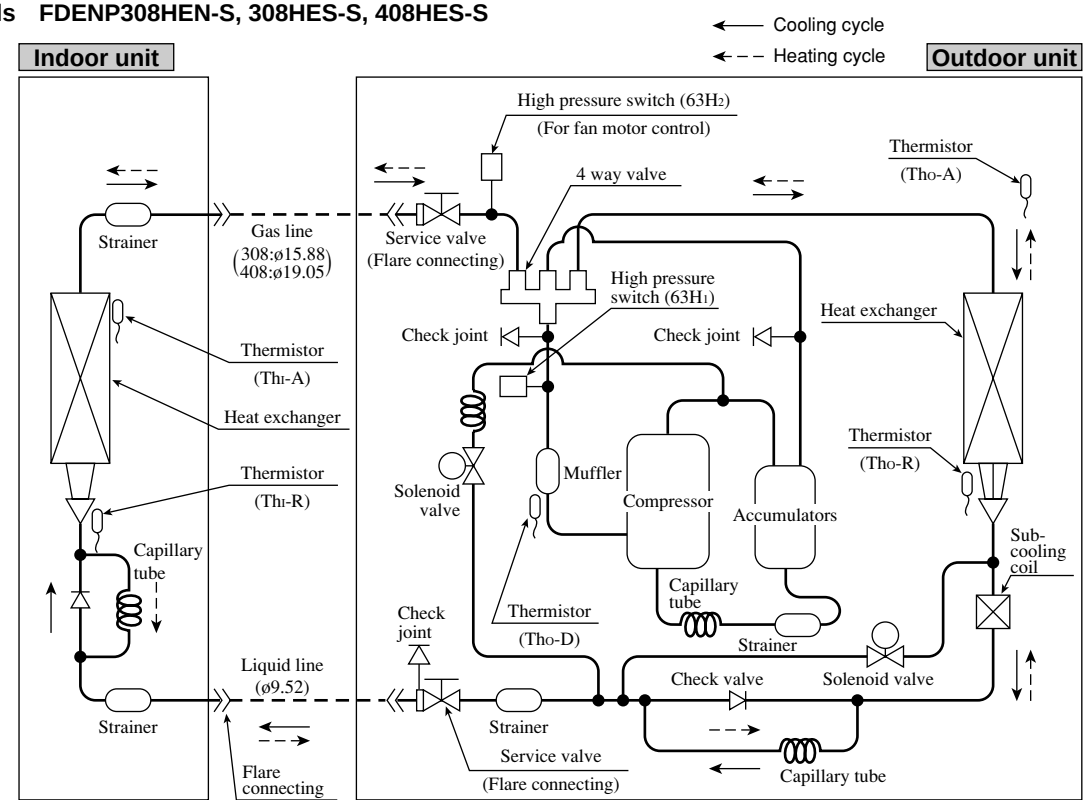


10.2.5 Piping system

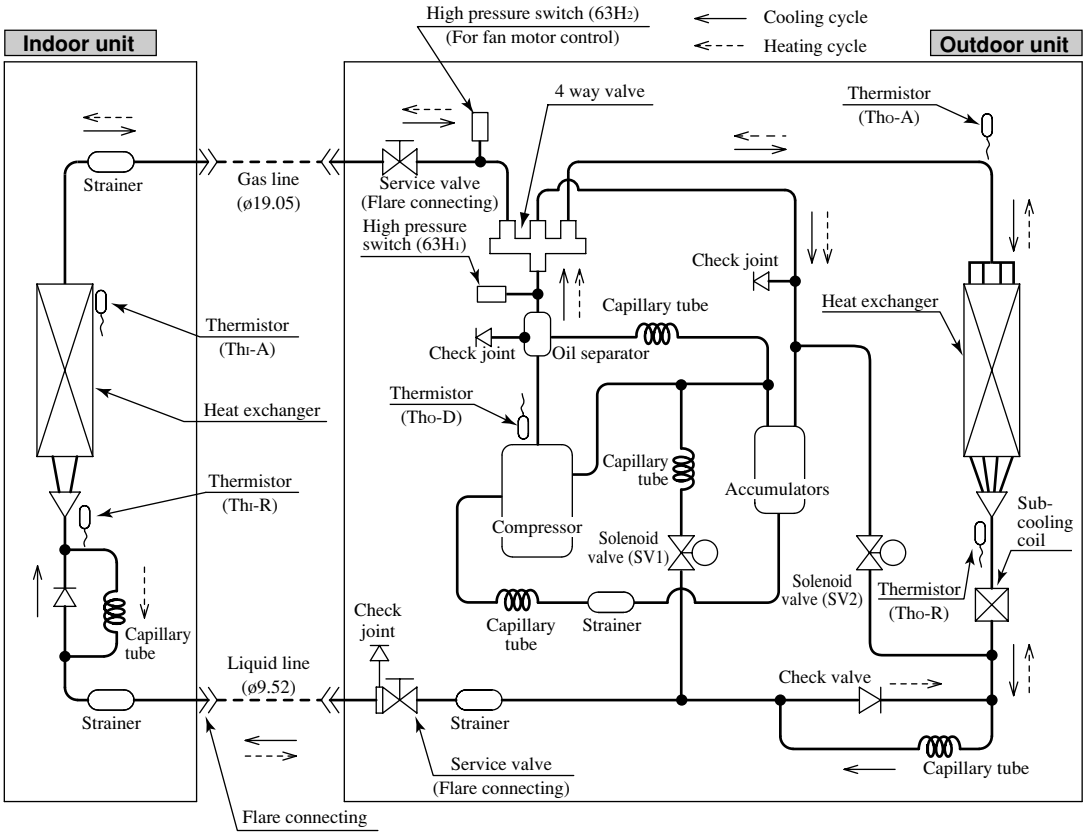
Models **FDEN208HEN-S1, 258HEN-S1**
FDENP208HEN-S, 258HEN-S



Models **FDENP308HEN-S, 308HES-S, 408HES-S**



Model FDENP508HES-S



Preset point of the protective devices

Parts name	Mark	Equipped unit	FDEN208, 258 type	FDENP208~258 type
Thermistor (for protection over loading in heating)	**Thi-R**	Indoor unit	OFF 68 °C ON 61 °C	
Thermistor (for frost prevention)			OFF 2.5 °C ON 10 °C	
Thermistor (for detecting discharge pipe temp.)	**Tho-D**	Outdoor unit	OFF 135 °C ON 90 °C	
Thermistor (for detecting heat exchange temp.)	**Tho-R**	Outdoor unit	OFF 70 °C ON 60 °C	
High pressure switch (for controlling FMo)	**63H2**	Outdoor unit	OFF 2.5MPa (25.5kgf/cm²) ON 2.06MPa (21kgf/cm²)	
High pressure switch (for protection)	**63H1**	Outdoor unit	——	OFF 3.24MPa (33kgf/cm²) ON 2.65MPa (27kgf/cm²)

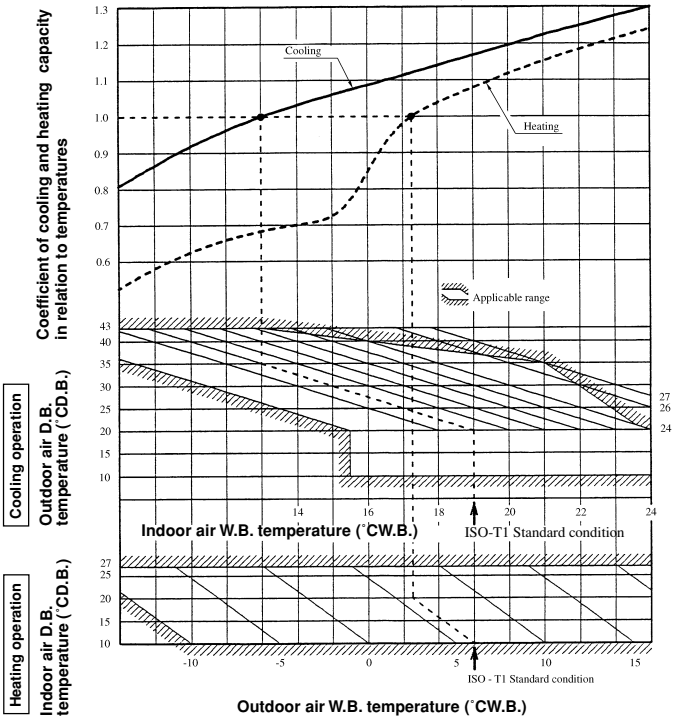
10.2.6 Selsction chart

Correct the cooling and heating capacity in accordance with the conditions as follows. The net cooling and heating capacity can be obtained in the following way.

Net capacity = Capacity shown on specification ¥ Correction factors as follows.

(1) Coefficient of cooling and heating capacity in relation to temperatures

Models FDEN208HEN-S1, 258HEN-S1, FDENP208HEN-S, 258HEN-S



Models FDENP308HEN-S, 308HES-S, 408HES-S, 508HES-S

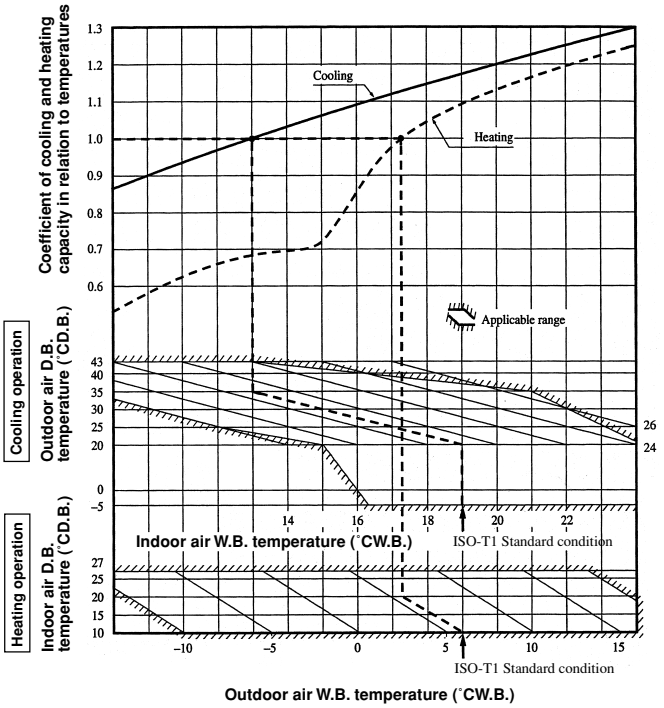


Table of bypass factor

Item \ Model		FDEN (P) 208 type	FDEN (P) 258 type	FDENP308 type	FDENP408,508 type
Air flow	Hi	0.031	0.030	0.036	0.018
	Lo	0.016	0.013	0.018	0.010

(2) Correction of cooling and heating capacity in relation to air flow rate control (fan speed)

Coefficient: 1.00 at High, 0.95 at Low

(3) Correction of cooling and heating capacity in relation to one way length of refrigerant piping

It is necessary to correct the cooling and heating capacity in relation to the one way equivalent piping length between the indoor and outdoor units.

Equivalent piping length(1) m		5	10	15	20	25	30	35	40	45	50	55
Heating		1.0	1.0	1.0	1.0	1.0	0.995	0.995	0.99	0.99	0.985	0.985
Cooling	FDEN208 type FDENP208 type	1.0	0.995	0.995	0.99	0.985	0.985	0.98	—	—	—	—
	FDEN258 type FDENP258 type	1.0	0.995	0.99	0.985	0.98	0.975	0.97	—	—	—	—
	FDENP308 type	1.0	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.9
	FDENP408 type	1.0	0.995	0.985	0.98	0.97	0.965	0.955	0.95	0.94	0.935	0.925
	FDENP508 type	1.0	0.99	0.975	0.965	0.95	0.94	0.925	0.915	0.9	0.89	0.875

Note (1) Equivalent piping length can be obtained by calculating as follows.
208, 258, 308 series [ø15.88(5/8")]: Equivalent piping length = Real piping length + (0.10 × Number or bends in piping)
408, 508, series [ø19.05(3/4")]: Equivalent piping length = Real piping length + (0.15 × Number of bends in piping)
[Equivalent piping length < Limitation length of piping + 5m]

(4) When the outdoor unit is located at a lower height than the indoor unit in cooling operation and when the outdoor unit is located at a higher height than the indoor unit in heating operation, the following values should be subtracted from the values in the above table.

Height difference between the indoor unit and outdoor unit in the vertical heigh sifference	5m	10m	15m	20m	25m	30m
Adjustment coefficient	0.01	0.02	0.03	0.04	0.05	0.06

Piping length limitations

Item \ Model	FDEN208, 258 type FDENP208, 258 type	FDENP308, 408, 508 type
Max. one way piping length	30m	50m
Max. vertical height difference	20m (Outdoor unit is higher) 15m (Outdoor unit is lower)	30m (Outdoor unit is higher) 15m (Outdoor unit is lower)

Note(1) Values in the table indicate the one way piping length between the indoor and outdoor units.

How to obtain the cooling capacity

Example: The net cooling capacity of the model FDENP308HEN-S with the air flow "High", the piping length of 15m, the outdoor unit located 5m lower than the indoor unit, indoor wet-bulb temperature at 19.0 ˚C and outdoor dry-bulb temperature 35 ˚C is

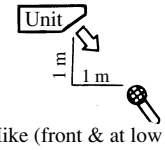
Net cooling capacity = 7100 × 1.00 × (0.98 - 0.01) × 1.0 = 6887 w

- 7100: FDENP308HEN-S
- 1.00: Air flow "High"
- (0.98 - 0.01): Length 15m. Height difference 5 m
- 1.0: Factor by air temperatures

10.2.7 Noise level

Notes (1) The data are based on the following conditions.
Ambient air temperature:
Indoor unit 27˚C DB, 19˚C WB.
Outdoor unit 35˚C DB.

Indoor unit
Measured based on JIS B 8616
Mike position as below



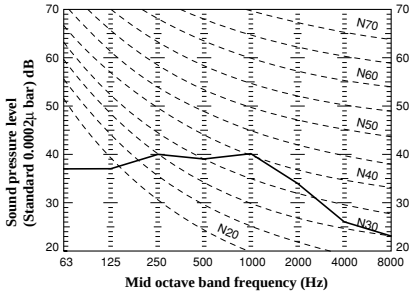
Mike (front & at low point)

Outdoor unit
Measured based on JIS B 8616
Mike position: at highest noise level in position as below
Distance from front side 1 m
Height 1 m

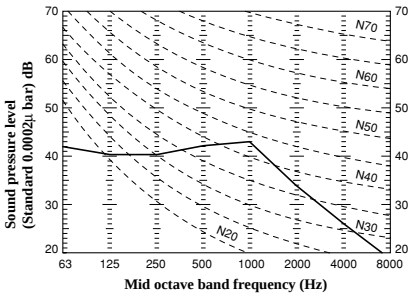
(2) The data in the chart are measured in an unechonic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

(1) Indoor unit

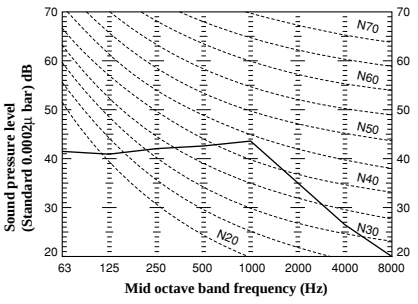
Model FDEN208H
Noise level 43 dB (A) at HIGH
38 dB (A) at LOW


Sound pressure level (Standard 0.0002μ bar) dB
Mid octave band frequency (Hz)
63 125 250 500 1000 2000 4000 8000
20 30 40 50 60 70
N70 N60 N50 N40 N30 N20

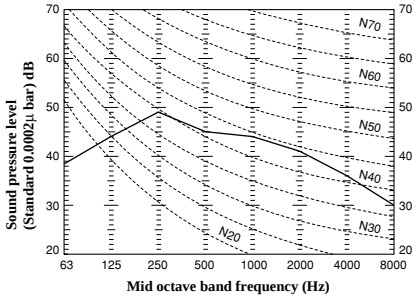
Model FDEN258H
Noise level 44 dB (A) at HIGH
39 dB (A) at LOW


Sound pressure level (Standard 0.0002μ bar) dB
Mid octave band frequency (Hz)
63 125 250 500 1000 2000 4000 8000
20 30 40 50 60 70
N70 N60 N50 N40 N30 N20

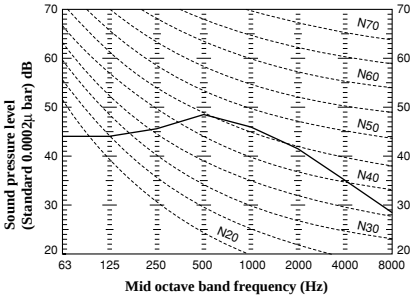
Model FDEN308H
Noise level 45 dB (A) at HIGH
39 dB (A) at LOW


Sound pressure level (Standard 0.0002μ bar) dB
Mid octave band frequency (Hz)
63 125 250 500 1000 2000 4000 8000
20 30 40 50 60 70
N70 N60 N50 N40 N30 N20

Model FDEN408H
Noise level 49 dB (A) at HIGH
49 dB (A) at LOW

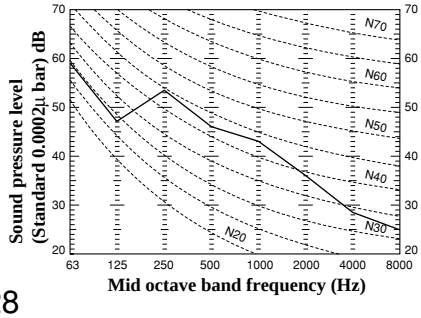

Sound pressure level (Standard 0.0002μ bar) dB
Mid octave band frequency (Hz)
63 125 250 500 1000 2000 4000 8000
20 30 40 50 60 70
N70 N60 N50 N40 N30 N20

Model FDEN508H
Noise level 50 dB (A) at HIGH
44 dB (A) at LOW

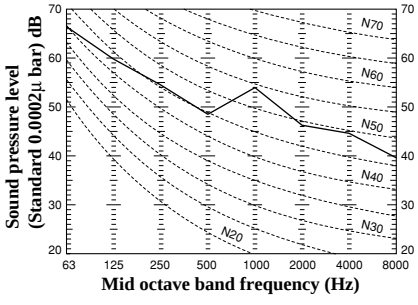

Sound pressure level (Standard 0.0002μ bar) dB
Mid octave band frequency (Hz)
63 125 250 500 1000 2000 4000 8000
20 30 40 50 60 70
N70 N60 N50 N40 N30 N20

(2) Outdoor unit

Model FDC208HEN3A
Noise level 52dB (A)

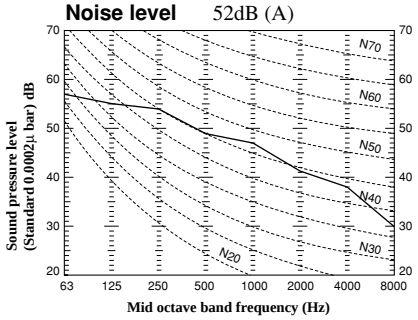

Sound pressure level (Standard 0.0002μ bar) dB
Mid octave band frequency (Hz)
63 125 250 500 1000 2000 4000 8000
20 30 40 50 60 70
N70 N60 N50 N40 N30 N20

Model FDC258HEN3A
Noise level 52dB (A)


Sound pressure level (Standard 0.0002μ bar) dB
Mid octave band frequency (Hz)
63 125 250 500 1000 2000 4000 8000
20 30 40 50 60 70
N70 N60 N50 N40 N30 N20

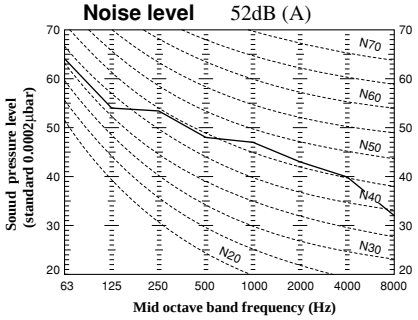
Model FDCP208HEN3A

Noise level 52dB (A)



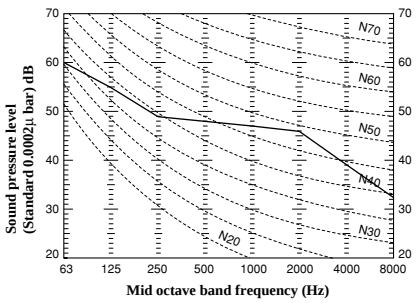
Model FDCP258HEN3A

Noise level 52dB (A)



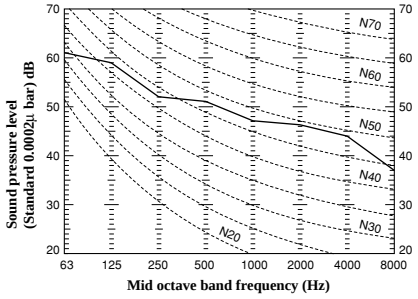
Models FDCP308HEN3, 308HES3

Noise level 52dB (A)



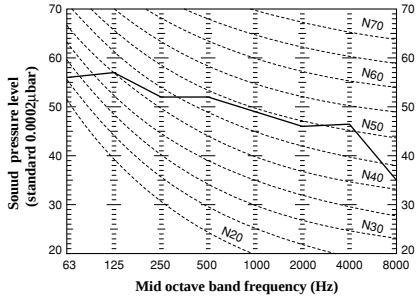
Model FDCP408HES3

Noise level 54dB (A)



Model FDCP508HES3

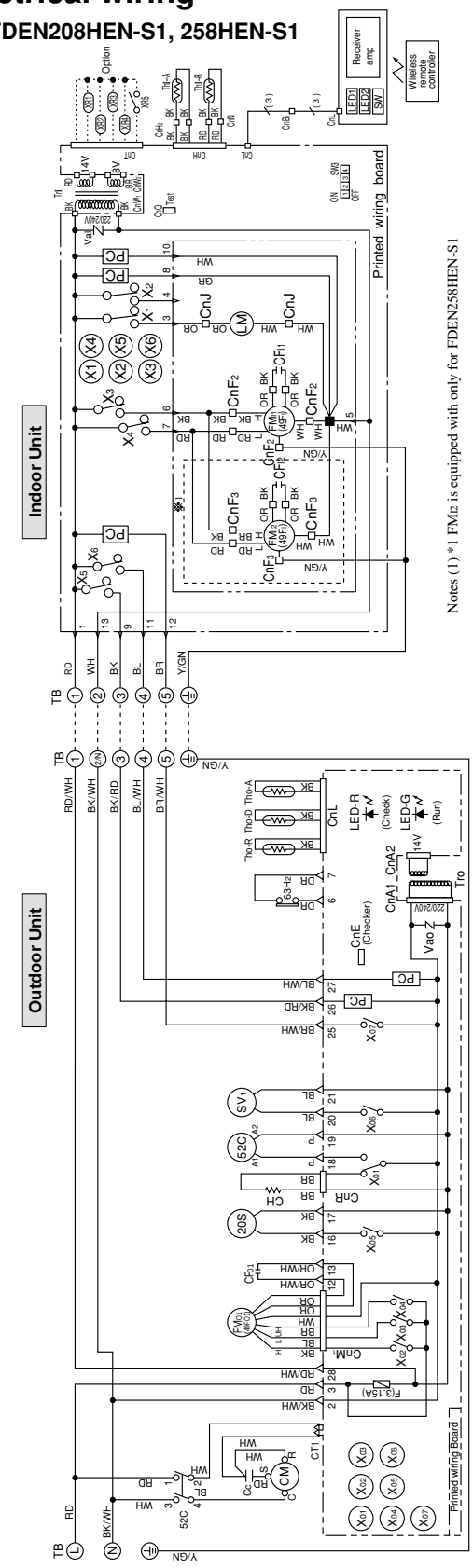
Noise level 55dB (A)



10.3 ELECTRICAL DATA

10.3.1 Electrical wiring

Models FDEN208HEN-S1, 258HEN-S1



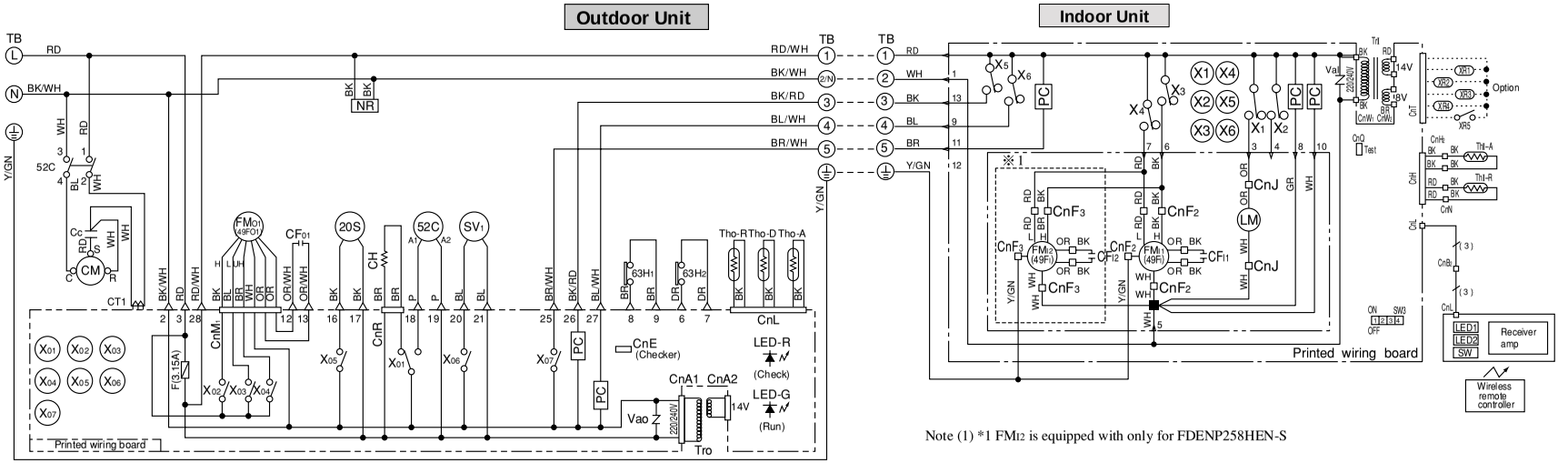
Color mark

Mark	Color	Mark	Color
BK	Black	**BK/RD**	Black/Red
BL	Blue	**BK/WH**	Black/White
BR	Brown	**BL/WH**	Blue/White
GR	Gray	**BR/WH**	Brown/White
OR	Orange	**OR/WH**	Orange/White
PK	Pink	**RD/WH**	Red/White
RD	Red	**Y/GN**	Yellow/Green
WH	White		
Y	Yellow		

Meaning of marks

Mark	Parts name	Mark	Parts name
CC	Capacitor for CM	**Thi-R**	Thermistor
CFIN,2	Capacitor for FMI	**Tho-A**	Thermistor
CFO	Capacitor for FMO	**Tho-D**	Thermistor
CH	Crankcase heater	**Tho-R**	Thermistor
CM	Compressor motor	**TrI**	Transformer (Indoor unit)
CnA ~ W	Connector (□ mark)	**Tro**	Transformer (Outdoor unit)
CT1	Current sensor	**Val**	Thermistor
F	Fuse	**Vao**	Varistor
FMIN,2	Fan motor (Indoor unit)	**20S**	4-way valve solenoid
FMO	Fan motor (Outdoor unit)	**49FI**	Internal thermostat for FMI
LED1	Indication lamp (Green - Run)	**49FO**	Internal thermostat for FMO
LED2	Indication lamp (Yellow - Check)	**52C**	Magnetic contactor for CM
LM	Louver motor	**X1~6**	Auxiliary relay
PC	Photo coupler	**X01~07**	Auxiliary relay
SV1	Solenoid coil (for control)	**63H2**	High pressure switch (for control)
SW	Switch (ON/OFF)	**▽**	Terminal (F)
SW3	Changeover switch	**■**	Connector
TB	Terminal block (○ mark)	**LED-G**	Indication lamp (Green)
Thi-A	Thermistor	**LED-R**	Indication lamp (Red)

Power source
1 Phase 220/240V 50Hz



Note (1) *1 FMI2 is equipped with only for FDENP258HEN-S

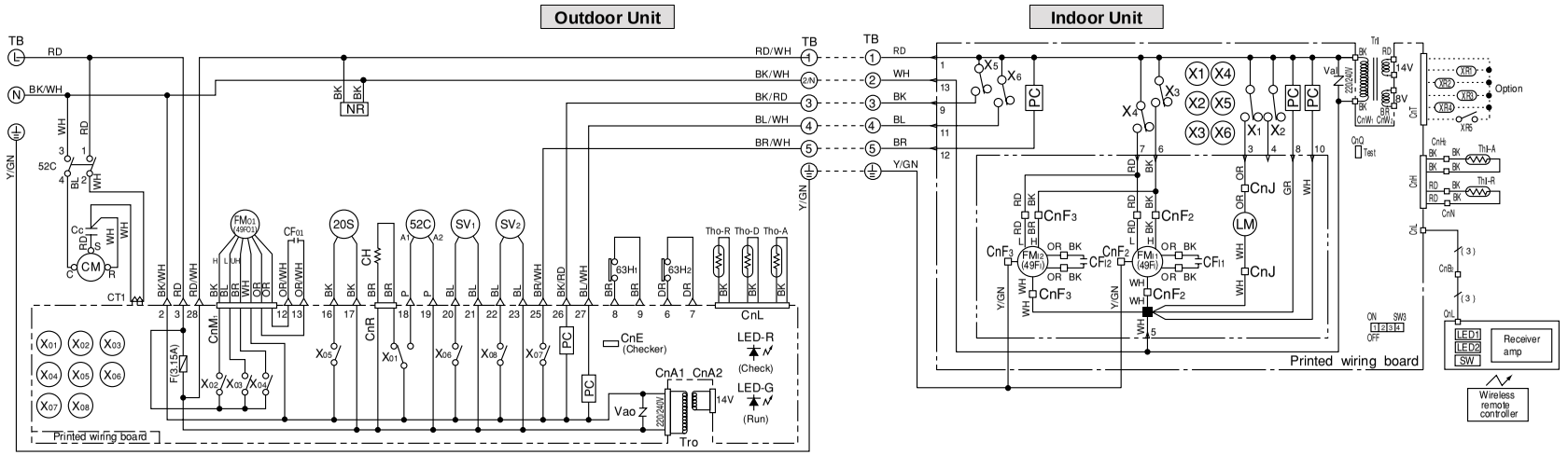
Meaning of marks

Mark	Parts name	Mark	Parts name
CC	Capacitor for CM	**ThI-R**	Thermistor
CFI1,2	Capacitor for FMI	**Tho-A**	Thermistor
CFo	Capacitor for FMo	**Tho-D**	Thermistor
CH	Crankcase heater	**Tho-R**	Thermistor
CM	Compressor motor	**TrI**	Transformer (Indoor unit)
CnA ~ W	Connector (□ mark)	**Tro**	Transformer (Outdoor unit)
CT1	Current sensor	**Val**	Varistor
F	Fuse	**Vao**	Varistor
FMI1,2	Fan motor (Indoor unit)	**20S**	4-way valve solenoid
FMo	Fan motor (Outdoor unit)	**49FI**	Internal thermostat for FMI
LED1	Indication lamp (Green - Run)	**49Fo**	Internal thermostat for FMo
LED2	Indication lamp (Yellow - Timer/Check)	**52C**	Magnetic contactor for CM
LM	Louver motor	**X1~6**	Auxiliary relay
NR	Surge suppressor	**X01~07**	Auxiliary relay
PC	Photo coupler	**63H1**	High pressure switch (for protection)
SV1	Solenoid coil (for control)	**63H2**	High pressure switch (for control)
SW	Switch (ON/OFF)	◁	Terminal (F)
SW3	Changeover switch	■	Connector
TB	Terminal block (○ mark)	**LED-G**	Indication lamp (Green)
ThI-A	Thermistor	**LED-R**	Indication lamp (Red)

Color mark

Mark	Color	Mark	Color
BK	Black	**BK/RD**	Black/Red
BL	Blue	**BK/WH**	Black/White
BR	Brown	**BL/WH**	Blue/White
GR	Gray	**BR/WH**	Brown/White
OR	Orange	**OR/WH**	Orange/White
PK	Pink	**RD/WH**	Red/White
RD	Red	**Y/GN**	Yellow/Green
WH	White		
Y	Yellow		

Power source
1 Phase 220/240V 50Hz



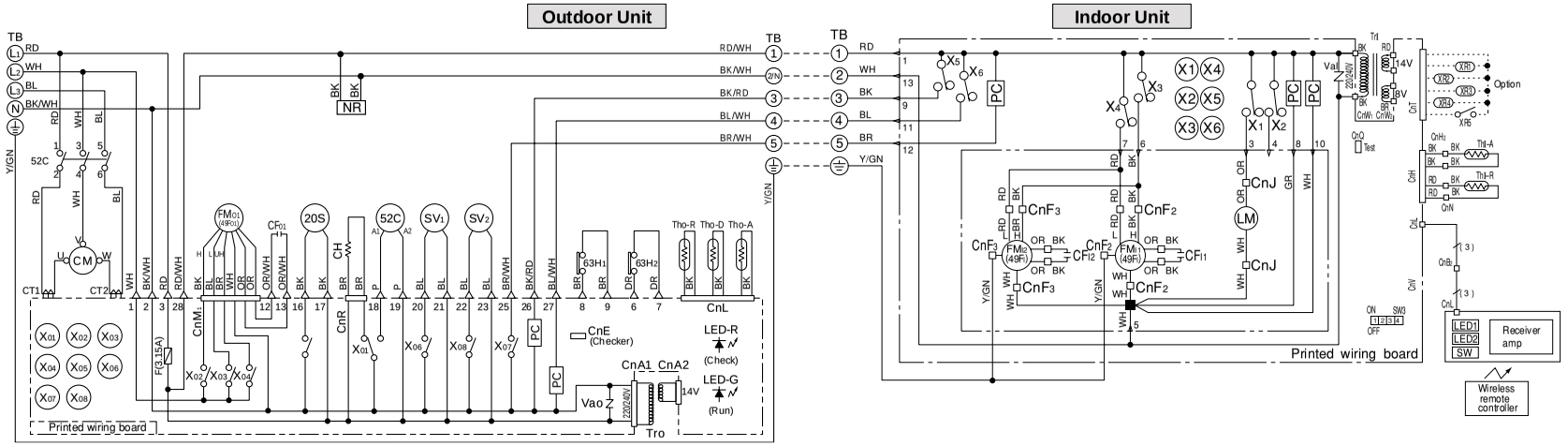
Meaning of marks

Mark	Parts name	Mark	Parts name
CC	Capacitor for CM	**Thi-R**	Thermistor
CFi1,2	Capacitor for FMi	**Tho-A**	Thermistor
CFo	Capacitor for FMo	**Tho-D**	Thermistor
CH	Crankcase heater	**Tho-R**	Thermistor
CM	Compressor motor	**Tri**	Transformer (Indoor unit)
CnA ~ W	Connector (□mark)	**Tro**	Transformer (Outdoor unit)
CT1	Current sensor	**Val**	Thermistor
F	Fuse	**Vao**	Varistor
FMi1,2	Fan motor (Indoor unit)	**20S**	4-way valve solenoid
FMo	Fan motor (Outdoor unit)	**49Fi**	Internal thermostat for FMi
LED1	Indication lamp (Green - Run)	**49Fo**	Internal thermostat for FMo
LED2	Indication lamp (Yellow - Check)	**52C**	Magnetic contactor for CM
LM	Louver motor	**X1~6**	Auxiliary relay
NR	Surge suppressor	**X01~8**	Auxiliary relay
PC	Photo coupler	**63H1**	High pressure switch (for protection)
SV1,2	Solenoid coil (for control)	**63H2**	High pressure switch (for control)
SW	Switch (ON/OFF)	◁	Terminal (F)
SW3	Changeover switch	■	Connector
TB	Terminal block (○mark)	**LED-G**	Indication lamp (Green)
Thi-A	Thermistor	**LED-R**	Indication lamp (Red)

Color mark

Mark	Color	Mark	Color
BK	Black	**BK/RD**	Black/Red
BL	Blue	**BK/WH**	Black/White
BR	Brown	**BL/WH**	Blue/White
GR	Gray	**BR/WH**	Brown/White
OR	Orange	**OR/WH**	Orange/White
PK	Pink	**RD/WH**	Red/White
RD	Red	**Y/GN**	Yellow/Green
WH	White		
Y	Yellow		

Power source
3 Phase 380/415V 50Hz



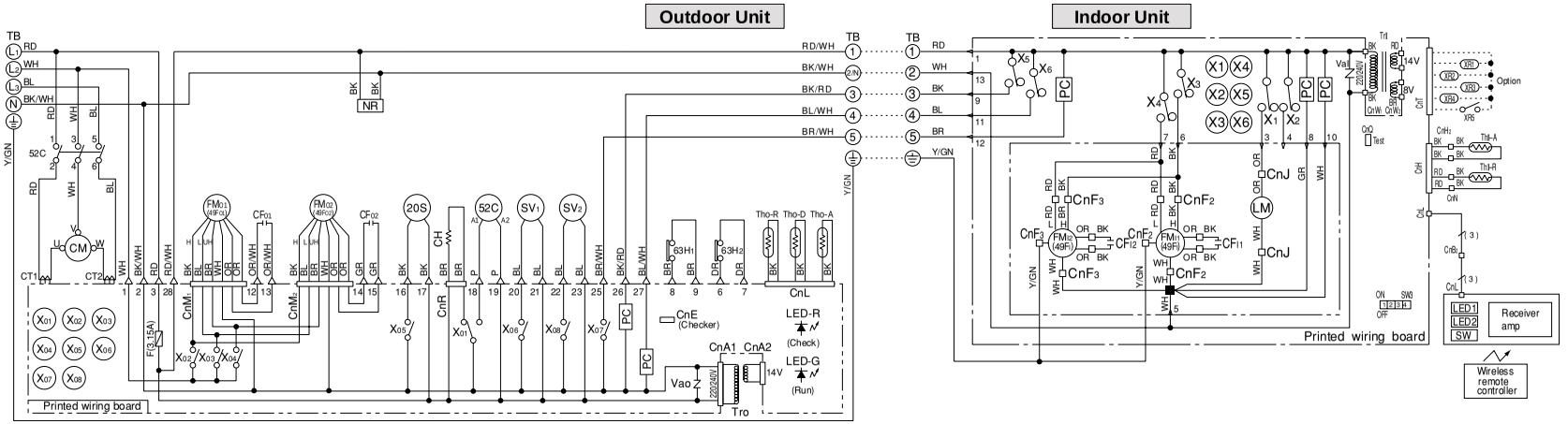
Meaning of marks

Mark	Parts name	Mark	Parts name
CF1,2	Capacitor for FMI	**Tho-A**	Thermistor
CFO1	Capacitor for FMO	**Tho-D**	Thermistor
CH	Crankcase heater	**Tho-R**	Thermistor
CM	Compressor motor	**TrI**	Transformer (Indoor unit)
CnA ~ Z	Connector (□ mark)	**Tro**	Transformer (Outdoor unit)
CT1,2	Current sensor	**Val**	Varistor
F	Fuse	**Vao**	Varistor
FMI1,2	Fan motor (Indoor unit)	**20S**	4-way valve solenoid
FMO1	Fan motor (Outdoor unit)	**49FI**	Internal thermostat for FMI
LED1	Indication lamp (Green - Run)	**49FO1**	Internal thermostat for FMo
LED2	Indication lamp (Yellow - Check)	**52C**	Magnetic contactor for CM
LM	Louver motor	**X1~6**	Auxiliary relay
NR	Surge suppressor	**X01~08**	Auxiliary relay
PC	Photo coupler	**63H1**	High pressure switch (for protection)
SV1,2	Solenoid coil (for control)	**63H2**	High pressure switch (for control)
SW	Switch (ON/OFF)	◁	Terminal (F)
SW3	Changeover switch	■	Connector
TB	Terminal block (○ mark)	**LED-G**	Indication lamp (Green)
ThI-A	Thermistor	**LED-R**	Indication lamp (Red)
ThI-R	Thermistor		

Color mark

Mark	Color	Mark	Color
BK	Black	**BK/RD**	Black/Red
BL	Blue	**BK/WH**	Black/White
BR	Brown	**BL/WH**	Blue/White
GR	Gray	**BR/WH**	Brown/White
OR	Orange	**OR/WH**	Orange/White
P	Pink	**RD/WH**	Red/White
RD	Red	**Y/GN**	Yellow/Green
WH	White		

Power source
3 Phase 380/415V 50Hz



Meaning of marks

Mark	Parts name	Mark	Parts name
CF1,2	Capacitor for FMI	**Tho-A**	Thermistor
CFO1,2	Capacitor for FMO	**Tho-D**	Thermistor
CH	Crankcase heater	**Tho-R**	Thermistor
CM	Compressor motor	**TrI**	Transformer (Indoor unit)
CnA ~ Z	Connector (□ mark)	**Tro**	Transformer (Outdoor unit)
CT1,2	Current sensor	**Val**	Varistor
F	Fuse	**Vao**	Varistor
FMI1,2	Fan motor (Indoor unit)	**20S**	4-way valve solenoid
FMO1,2	Fan motor (Outdoor unit)	**49FI**	Internal thermostat for FMI
LED1	Indication lamp (Green-Run)	**49FO1,2**	Internal thermostat for FMO
LED2	Indication lamp (Yellow-Check)	**52C**	Magnetic contactor for CM
LM	Louver motor	**X1~6**	Auxiliary relay
NR	Surgesuppressor	**X01~08**	Auxiliary relay
PC	Photo coupler	**63H1**	High pressure switch (for protection)
SV1,2	Solenoid coil (for control)	**63H2**	High pressure switch (for control)
SW	Switch (ON/OFF)	◁	Terminal (F)
SW3	Changeover switch	■	Connector
TB	Terminal block (○ mark)	**LED-G**	Indication lamp (Green)
ThI-A	Thermistor	**LED-R**	Indication lamp (Red)
ThI-R	Thermistor		

Color mark

Mark	Color	Mark	Color
BK	Black	**BK/RD**	Black/Red
BL	Blue	**BK/WH**	Black/White
BR	Brown	**BL/WH**	Blue/White
GR	Gray	**BR/WH**	Brown/White
OR	Orange	**OR/WH**	Orange/White
P	Pink	**RD/WH**	Red/White
RD	Red	**Y/GN**	Yellow/Green
WH	White		

10.4 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

Same as the cooling/heating equipment for FDT(N) heat pump type. Refer to page 317.

10.5 APPLICATION DATA

SAFETY PRECAUTIONS

- Please read these "Safety Precautions" first then accurately execute the installation work.
- Though the precautionary points indicated herein are divided under two headings. ⚠WARNING and ⚠CAUTION, those points which are related to the strong possibility of an installation done in error resulting in death or serious injury are listed in the ⚠WARNING section. However, there is also a possibility of serious consequences in relationship to the points listed in the ⚠CAUTION section as well.
  In either case, important safety related information is indicated, so by all means, properly observe all that is mentioned.
- After completing the installation, along with confirming that no abnormalities were seen from the operation tests, please explain operating methods as well as maintenance methods to the user (customer) of this equipment, based on the owner's manual. Moreover, ask the customer to keep this sheet together with the owner's manual.

⚠ WARNING

- This system should be applied to places of office, restaurant, residence and the like. Application to inferior environment such as engineering shop could cause equipment malfunction.
- Please entrust installation to either the company which sold you the equipment or to a professional contractor. Defects from improper installations can be the cause of water leakage, electric shocks and fires.
- Execute the installation accurately, based on following the installation manual. Again, improper installations can result in water leakage, electric shocks and fires.
- When a large air-conditioning system is installed to a small room, it is necessary to have a prior planned counter-measure for the rare case of a refrigerant leakage, to prevent the exceeding of threshold concentration.
  In regards to preparing this countermeasure, consult with the company from which you perchased the equipment, and make the installation accordingly. In the rare event that a refrigerant leakage and exceeding of threshold concentration does occur, there is the danger of a resultant oxygen deficiency accident.
- For installation, confirm that the installation site can sufficiently support heavy weight. When strength is insufficient, injury can result from a falling of the unit.
- Execute the prescribed installation construction to prepare for earthquakes and the strong winds of typhoons and hurricanes, etc. Improper installations can result in accidents due to a violent falling over of the unit.
- For electrical work, please see that a licensed electrician executes the work while following the safety standards related to electrical equipment, and local regulations as well as the installation instructions, and that only exclusive use circuits are used.
  Insufficient power source circuit capacity and defective installment execution can be the cause of electric shocks and fires.
- Accurately connect wiring using the proper cable, and insure that the external force of the cable is not conducted to the terminal connection part, through properly securing it. Improper connection or securing can result in heat generation or fire.
- Take care that wiring does not rise upward, and accurately install the lid/service panel. Its improper installation can also result in heat generation or fire.
- When setting up or moving the location of the air conditioner, do not mix air etc. or anything other than the designated refrigerant (R22) within the refrigeration cycle.
  Rupture and injury caused by abnormal high pressure can result from such mixing.
- Always use accessory parts and authorized parts for installation construction. Using parts not authorized by this company can result in water leakage, electric shock, fire and refrigerant leakage.

⚠ CAUTION

- Execute proper grounding. Do not connect the ground wire to a gas pipe, water pipe, lightning rod or a telephone ground wire. Improper placement of ground wires can result in electric shock.
- The installation of an earth leakage breaker is necessary depending on the established location of the unit. Not installing an earth leakage breaker may result in electric shock.
- Do not install the unit where there is a concern about leakage of combustible gas.
  The rare event of leaked gas collecting around the unit could result in an outbreak of fire.
- For the drain pipe, follow the installation manual to insure that it allows proper drainage and thermally insulate it to prevent condensation. Inadequate plumbing can result in water leakage and water damage to interior items.

⚠ NOTICE

All Wiring of this installation must comply with NATIONAL, STATE AND LOCAL REGULATIONS. These instructions do not cover all variations for every kind of installation circumstance. Should further information be desired or should particular problems occur, the matter should be referred to Mitsubishi Heavy Industries. Ltd. through your local distributor.

⚠ WARNING

BE SURE TO READ THESE INSTRUCTIONS CAREFULLY BEFORE BEGINNING INSTALLATION. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD CAUSE SERIOUS INJURY OR DEATH, EQUIPMENT MALFUNCTION AND/OR PROPERTY DAMAGE.

10.5.1 Installation of indoor unit

(1) Selection of installation location

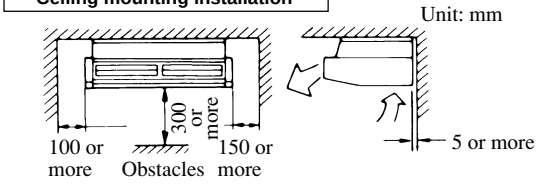
(a) A place where good air circulation and delivery can be obtained.
(b) A place where ceiling has enough strength to support the unit.
(c) A place where there is no obstacle around the return air inlet and supply air outlet ports.
(d) A place where there is no moist air or oil vapor which may harm the heat exchanger.
(e) A place where the space shown below is secured.
(f) This unit uses a microcomputer as a control device. Therefore avoid installing the unit near the equipment that generates strong electromagnetic waves and noise.

Air reach Unit: m

Model	FDEN208H	FDEN258H	FDEN308H	FDEN408H,508H
Air reach	7.5	8	9	9.5

[Conditions]
(1) Installation height .... 2.4~3.0 m above the floor
(2) Fan speed .... High
(3) Air flow speed at reach point .... 0.5 m/sec

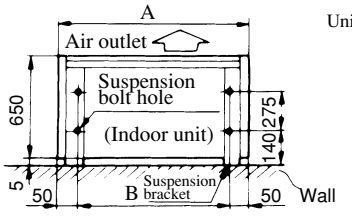
Ceiling mounting installation



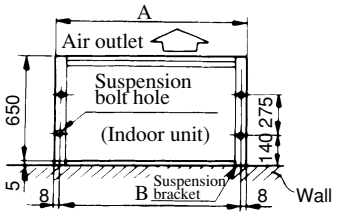
(2) Installation preparation

(a) Drilling of holes for interconnecting piping and wiring.
1) Drill a hole through the wall in accordance with the piping diameter. We recommend using a hole saw drill of 70~86mm diameter and the hole should be drilled on an incline from inside to outside.
2) Insert the accessory piping sleeve into the hole and cut it to the proper length in accordance with wall thickness.
(b) Installation of suspension bolts.
1) Use the template sheet to determine the positions of suspension bolts and refrigerant pipings. The refrigerant piping can be routed either to the right, left, top or rear.
2) Positions of suspension bolts are as in the drawing below.

● When the suspension brackets face in



● When the suspension brackets face out

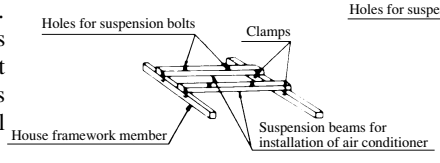


Unit: mm

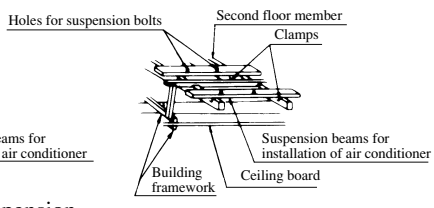
Item	A	B	C
FDEN208H	1000	900	984
FDEN258H 308H 408H	1260	1160	1244
FDEN508H	1470	1370	1454

3) In case of wooden structures.
- Use main strength members for suspension.
- When the suspension beams have members spaced 900 mm apart use small beams that are at least 6 cm square, in case the beams are spaced more than 180 mm apart use small beams that are more than 90 mm square.

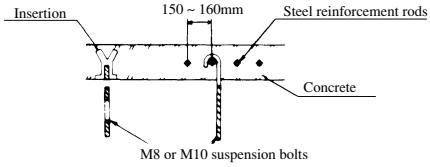
In case of wooden framework construction



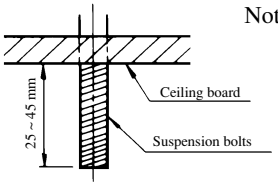
In case of wooden framework (two storied building)



4) In case of ferro-concrete buildings.
Fix the suspension bolts in the following way.



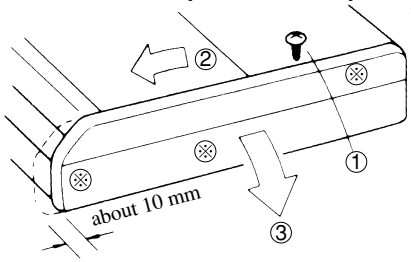
5) Length of suspension.
(in case of exposed type installation)



Notes (1) In case the suspension bracket is set to face in, and the suspension bolts are made to the length as shown in the left drawing, the bolts ends will be put in the plastics caps of the indoor unit top panel.
(2) Do not remove the plastics caps.

(3) Installation of indoor unit

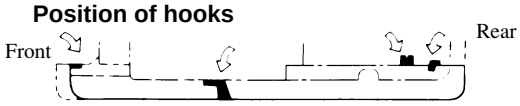
(a) Detach the inside panel and suspension bracket.



① Remove a fixing bolt of the side panel.

② Unhook four hooks (marked ※) by sliding the side panel in front side about 10 mm, and detach the side panel from the unit.

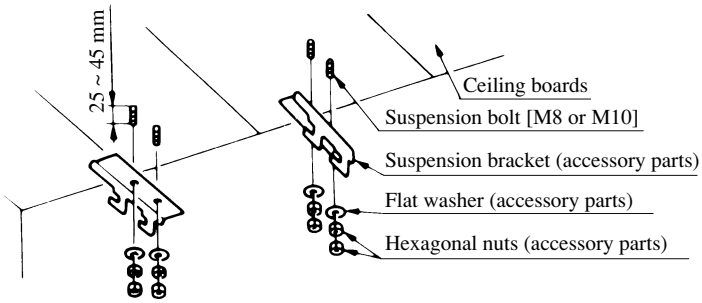
Position of hooks



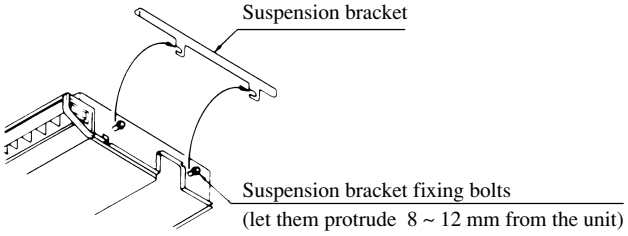
⇦ Side for front side about 10 mm

(b) In case of exposed installation to the ceiling (with suspension brackets facing in)

1) Fix the suspension brackets to suspension bolts.

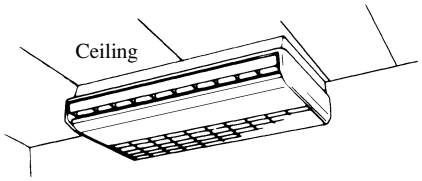


2) Hook the unit to suspension brackets.



3) Fix unit securely in place by tightening the suspension bracket fixing bolts.

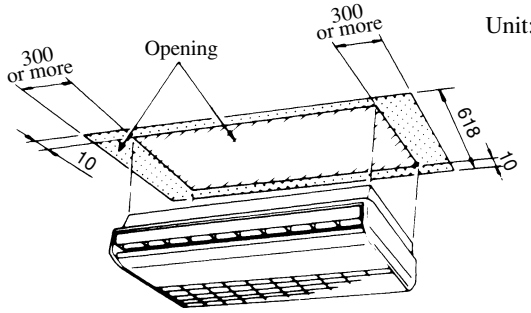
4) Attach the side panels and installation is finished.



(c) In case the unit is half recessed into the ceiling (the suspension brackets facing outside).

1) Open a hole in the ceiling large enough for the unit and the necessary installation work. (Fill up the excess opening after the installation work is finished.)

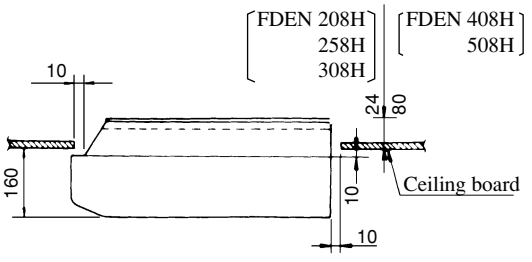
Unit: mm



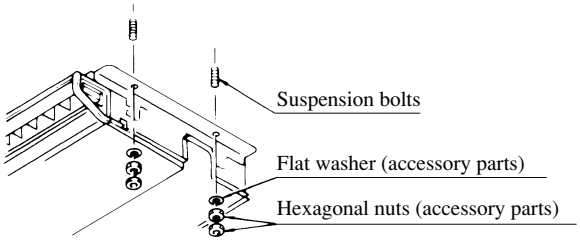
2) Installation space dimensions.

(Plug in dimensions)

Unit: mm

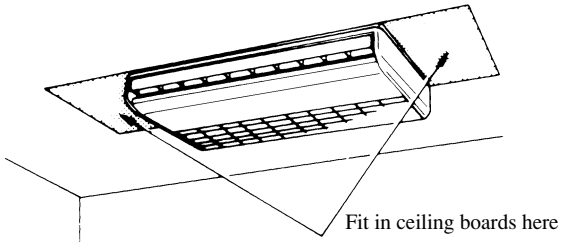


3) Mount the unit using suspension bolts.



4) Securely tighten the nuts and fix the indoor unit in place.

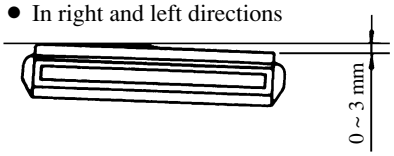
5) Attach the side panels and fit in ceiling board in the space around the unit and the work is finished.



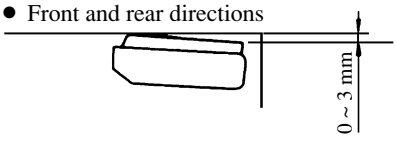
(d) Gradient for drainage

Mounting with proper gradient for drainage is needed as shown below.

- In right and left directions



- Front and rear directions

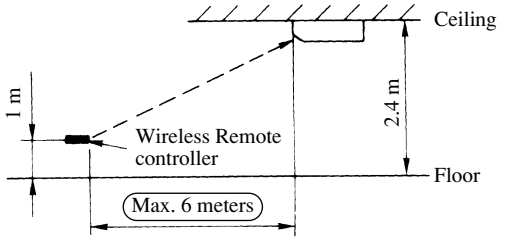


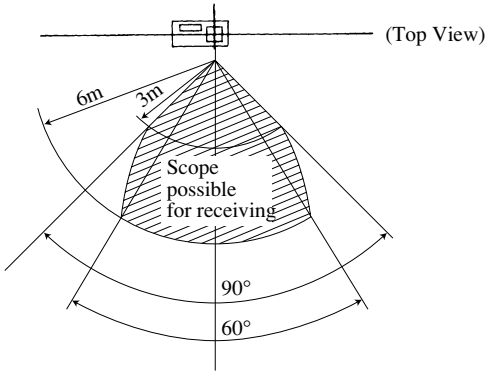
Note (1) In case of left-hand side drainage, the gradient will be to the opposite side.

⚠ Caution

- In case of gradient is contrary, water may leak out.
- Indoor side of drain pipe must be thermally insulated.

(4) Cautions for wireless remote controller operation





<Condition> Illuminance (Brightness) of the receiver area is about 360 lux.

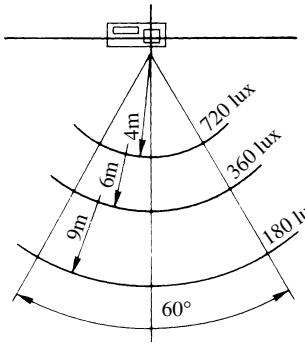
(In general office environments, there is no ceiling light source within a distance of one meter from the Air Conditioner Unit. The illuminance of a desktop is approx 1,000 lux in the above conditions.)

Notes (1) When the receiving angle is 90°, the receiving distance decrease to 3 meters.

(2) Be sure to point the Remote Controller correctly towards the Receiver.

(3) The operating range is as shown in the left drawing, but the range is changed in according to the conditions, as illumination, sunlight and etc.

(4) If the Receiver is being subjected to direct sunlight or intense lighting, the valid operating range may decrease and result in the Receiver being unable to receive the Control Signal from the Remote Controller.



(Top view)

(The relationship between Receiver surface illuminance and the signal reception distance.
When the illuminance decreases by 50%, the receiving range increase by 50%.)

10.5.2 Installation of outdoor unit

This is same as FDT(N) heat pump series. Refer to page 338.

10.6 MAINTENANCE DATA

This is same as FDT(N) heat pump series. Refer to page 348.